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The THERAPEUTIC GAZETTE

INCORPORATING

MEDICINE AND THE MEDICAL AGE

A Monthly Journal of Practical Therapeutics

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Whole Series, Vol. XLIV. DETROIT, MICH., SEPTEMBER 15, 1920. Third Series, Vol. XXXVI, No. 9.

ORIGINAL COMMUNICATIONS.

POSTULATES ON THE COUGH REFLEX IN SOME OF ITS MEDICAL AND SURGICAL PHASES.

BY CHEVALIER JACKSON, M.D.,

Professor of Laryngology in the Jefferson Medical College of Philadelphia.

The chief function of the cough reflex is to protect the lungs from a dangerous external intruder or internal enemy. As the author has often stated, "The cough reflex is the watch-dog of the lungs." In view of this function it seems strange that medical men and surgeons continually drug this watch-dog asleep when his efforts are most needed.

Morphine, heroin, cocaine, ether and chloroform have indirectly killed thousands by abolition of the cough reflex for one that has resulted from direct toxicity.

Evidence of this fact is conclusive to every observer who will look at the matter with an open mind, though obviously laboratory and necroptic data are difficult to produce. Certain postulates, however, leave little ground for dispute.

1. Admitting that blood gaining access to the smaller bronchi and clotting there will break down and become septic, and admitting further that the only way of ridding the bronchi of blood is by the cough reflex, why does the surgeon almost universally permit morphine to be given preliminary to anesthesia or immediately after operation on the air passages?

2. Admitting again the same points, why does the surgeon advocate the intratracheal injection of a cocaine solution through the interannular membrane preliminary to the incision of the trachea in tracheotomy for the special purpose of abolition of the cough reflex in order to make his work less annoying?

3. Admitting again, does it not seem prudent in all operations in which there is any chance for blood to gain access to the lungs to use either (*a*) no anesthetic at all, (*b*) infiltration only of those tissues from which efferent impulses for the bechic cycle do not arise, or best of all (*c*) intratracheal insufflation of ether.[1]

4. Admitting that the most efficient, and the only non-operative, way of removing pus from the lung is by bechic expulsion aided in the smaller bronchi particularly by ciliary action, why do the surgeon and the medical man obtund the cough reflex with heroin and morphine in purulent pulmonary disease?

5. Admitting that secretions in the trachea and larger bronchi contain at least a few bacteria, and admitting that pneumonia is an infective disease, does it not seem possible that some, at least, of the post-anesthetic pneumonias are due to the temporary abolition of the cough reflex by the general anesthetic?

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[1]Auer and Meltzer: Insufflation Anesthesia. *Med. Record*, vol. lxxvii, p. 477. Also Bulletins Rockefeller Institute.

Elsberg, Chas. A.: Anesthesia by the Intratracheal Insufflation of Air and Ether. *Annals of Surgery*, February, 1911.

Janeway, Henry: Intratracheal Anesthesia from the Standpoint of the Nose, Throat and Oral Surgeon. *The Laryngoscope*, November, 1913.

6. May not post-anesthetic (or post-operative, or post-tonsillectomy) pulmonary abscess be of similar origin?

7. Making the same admissions, does it not seem that we increase the risk of post-operative pneumonia by the preliminary or post-operative use of morphine in surgical cases requiring general anesthesia?

8. Admitting that influenza is an infective disease and one frequently complicated by pneumonia, which is also an infective disease (atrium unknown and immaterial), is it not unwise to use any antibechic in any case of influenza or in any person exposed to influenzal infection?

In the author's opinion the foregoing postulates afford food for thought and abundant material for experimental work.

THE SUPERIOR LONGITUDINAL SINUS ROUTE.[1]

BY JAMES H. McKEE, M.D.,
Professor of Pediatrics in the Post-Graduate School of the University of Pennsylvania (Polyclinic Section).

Until quite recently intravenous therapy in infants, like the withdrawal of blood for cultural and other purposes, has offered great difficulties. The superior longitudinal sinus route was first pursued by Marfan in 1898, when he injected normal saline solution into that large and accessible vessel. In 1915 Tobler[2] wrote an important paper describing the technique of this procedure, and Helmholz,[3] of Chicago, deserves great credit for emphasizing the advantages of sinus punctures and injections and for popularizing the method among the pediatricians of this country. The same year Unger[4] described an ingenious apparatus for the direct transfusion of blood from the vein of the donor to the superior longitudinal sinus of the infant recipient. Hunter Dunn[5] of Boston and Brown and Smith[6] of Toronto have since contributed important papers which have materially added to our knowledge of this interesting subject.

It is little wonder that at first sinus puncture seemed a shockingly bold procedure. We had palpated fontanelles for years, but in a very gentle manner; while mothers had regarded the "soft-spot" in the head as forbidden ground, carefully removing the seborrheic patches from the rest of the scalp and leaving them to grace this region. Among the harrowing tales of my childhood was one from Columbus, Ga.: A family of that town had gone to church on Sunday morning, leaving the baby in charge of a half-grown negress. They returned to find a dead baby and a terribly frightened maid. According to the story, she had punctured the fontanelle with a needle. So marked has been this prejudice that only recently a surgical colleague was known to criticize his pediatric brother for employing the sinus route.

A moment's consideration, however, will convince the medical cynic that there is no large vein in the infant's body so near the surface and so readily entered as the superior longitudinal sinus. The average distance of penetration to enter the sinus is from 1/4 to 5/16 of an inch. The average diameter of the vessel at the anterior portion of the fontanelle is 3/32 of an inch; at the posterior angle 4/32 of an inch; and one inch along the suture, often open, 5/32 of an inch. It is therefore advisable to enter the needle at the posterior angle of the fontanelle or through the suture just behind it (Brown and Small[6]). It is averred that there are no anomalies in the position of this vessel. More than this, just as the median cephalic vein of the adult patient is rendered tense by the tourniquet applied to his arm, so is the superior longitudinal sinus made tense when the baby cries. Again, as the needle enters the sinus the operator detects an immediate diminution of resistance, much as he does when the lumbar puncture needle pierces the spinal dura.

Experience has demonstrated that there is little danger in puncturing the sinus, or

in injecting various therapeutic agents into its blood stream. As a matter of fact, in their 100 cases, Brown and Smith transfixed the sinus on at least four occasions. I have accidentally transfixed it in one case. In one case the authors mentioned withdrew 5 Cc. of cerebrospinal fluid. Then, as the needle was withdrawn into the lumen of the sinus, they secured 5 Cc. of blood. No untoward symptoms resulted; nor did they in my case. In another case, one of tuberculous meningitis, Brown and Smith transfixed the vessel. Yet at autopsy they were unable to demonstrate any macroscopic injury to the vessel or the brain. Indeed, such negative results might have been anticipated by clinicians who have done lateral ventricle or corpus-callosum punctures.

CLINICAL USES OF THE SINUS ROUTE.

1. Though this is a therapeutic symposium, it is impossible to pass over the clinical advantages offered by the sinus when the infant's blood is needed for cultural or Wassermann studies. Blood for culture may be secured without difficulty and without contamination, whereas the external jugular vein, even when dissected out, may be found quite collapsed. How often have I seen an infant's great toe split to the bone and a test-tube strapped to it with adhesive tape in order that meager quantities of blood might slowly be collected for Wassermann tests. Indeed, several of our Philadelphia General Hospital internes were convinced that our feeding cases did badly after blood was removed in this manner. On the other hand, from the superior longitudinal sinus sufficient blood may be secured in a few seconds' time. I have secured it in the office and in the laboratory. I have watched Dr. Leebron secure it in my dispensary. Blood has been procured from a sleeping baby without disturbing its sleep. In no instance that has come to our knowledge has any harmful result followed.

HEMORRHAGIC DISEASE OF THE NEW-BORN.

In one form or another, or in many forms, such as melena, hematemesis, epistaxis, hemorrhage from the navel, meningeal hemorrhage of non-traumatic origin, etc., hemorrhage in the early days of life is a dangerous, ofttimes fatal symptom. Excluding syphilis, septic states, ulcers of the stomach and bowel, jaundice from anomalies of the biliary tract, etc., as etiologic factors, there remains a group of cases in which some substance (prothrombin) essential to the coagulation of the blood is either wanting or present in deficient amount. To such cases we apply the designation hemorrhagic disease of the new-born. Unlike hemophilia, such a condition may be present a very few days. Unlike hemophilia, it is more common in girls than in boys. All who have seen such cases in the past will have memories of worries, futile efforts, and infantile demise.

The best cure is now found in the introduction of human blood (Schloss and Commiskey,[7] Vincent,[8] etc.) and blood containing all of its elements. Next to human blood in efficiency ranks human serum (Weil,[9] Welsh,[10] etc.; though it was Sahli who first employed it). Then, of still less value, we have horse or rabbit serum (Leary,[11] Bigelow,[12] Lucas,[13] etc.)

How shall we introduce human blood from an adult donor into the infant's body? In the early cases, when the infants are not exsanguinated, or in the less severe cases, the simplest procedure would seem the best. If this fails we are not bereft of more radical resources. Such a method was first suggested by Schloss and Commiskey: Into a Luer or Record syringe of large caliber, 20 Cc. of blood is withdrawn from the medium cephalic or median basilic vein of one of the parents. This is immediately injected into the subcutaneous or muscular tissue of the infant patient. The authors named injected it into the subcutaneous tissues of the back; but in a personal experience injections into the vastus externi muscles cause much less discomfort. The fluid elements of the blood are rapidly absorbed. Much smaller quantities than are usually advocated (20-40 Cc.) are often amply efficacious.

In a 36-hour old infant, recently seen with Dr. W. Perry Cummins, 2 Cc. of the father's blood served to stop a severe hematemesis for three days. When at the expiration of that time bleeding recurred in a mild form, 10 Cc. of the paternal blood caused a permanent disappearance of the symptom. This baby was also the subject of Hirschsprung's disease.

In such employment of human blood one incurs less danger of hemolysis than in the use of the serum of another species. If the injections must perforce be repeated, there is less danger of anaphylaxis.

But what of the grave cases, or far-advanced cases? It is in such that the sinus route offers manifest advantages. Blood from the parent donor may then be withdrawn into a paraffined syringe, and immediately injected into the sinus of the infant; one may employ the Vincent tubes, or a skilled surgeon may directly transfuse with the ingenious apparatus of Unger.

CONGENITAL SYPHILIS.

I have had little experience in the treatment of congenital syphilis with the newer arsenical preparations, delegating this work to experts. In a baby of three months, seen with Dr. George E. Johnson, however, no difficulty was experienced in entering the sinus, nor in introducing into it the appropriate dose of neosalvarsan in 40 Cc. of saline. Mercury was positively contraindicated in this case, as the baby had a specific nephritis accompanied by marked edema. Dr. Johnson's technique stood me in good stead, as he had given a good many injections of salvarsan and neosalvarsan. We combined forces, for he had never made a sinus puncture.

Brown and Smith have injected diarsenobenzol into the sinus in 50 cases, and without mishap.

Theoretically, one is appalled at the thought of leakage from the longitudinal sinus in the employment of these preparations. Some pediatricians of my acquaintance state that they simply would not use this route for such specific therapy; but as mentioned before, the external jugular may be found collapsed, even after dissection, and it would seem that preconceived objections are brushed aside by the force of favorable statistics. Even thrombosis does not seem to occur.

MARANTIC AND MORIBUND STATES IN INFANTS.

In the past many such babies have been improved by the injection of normal salt solution or of glucose solutions into the bowel, the subcutaneous tissues, or the peritoneal cavity. The cases recorded by Hunter Dunn would seem to show that sinus injections are more efficacious than either hypodermoclysis or enteroclysis, and they are probably safer than intraperitoneal injections. Such therapy may actually save life, or it may furnish a bridge that carries a baby over a dangerous period.

He lays special stress upon the employment of 5-per-cent glucose solutions. He has shown that little of the glucose is eliminated by the kidneys. In all probability, therefore, it is utilized by the tissues. Assuming that the blood represents 1/15 of the infant's weight, and that the total quantity of blood may be safely increased by 1/4, he injects 1/60 of the infant's weight in grammes. The fluid is injected slowly, and distention of the veins of the scalp gives prompt evidence when the injection is made too rapidly.

ACIDOSES.

In serious acidoses, not responding to the usual employment of sodium bicarbonate and glucose by mouth and bowel, the sinus again offers an open invitation to more efficient therapy. It has been one of my great regrets that such injections were not employed in a fourteen months' old baby, another patient of Dr. Cummins. At first this baby evidenced a mild acidosis, clearly induced by a nursery milk. At a time when we pediatricians are convinced of the danger of volatile fatty acids in cow's milk, the milkman, with almost criminal complacency, continues to advocate 5-per-cent milk for babies. After two days of clinical improvement this baby was sud-

denly seized with convulsions that were only partially controlled by morphine, chloroform, and the oral and rectal use of sodium bicarbonate and glucose. Lumbar puncture was done, but though the fluid was under high pressure, and though 30 Cc. was withdrawn, the laboratory investigation revealed no chemic, cellular nor bacteriologic changes. The baby died suddenly, when her rectal temperature was 106°.

Were I called to see another such patient I would employ glucose solution in the manner advocated by Dunn.

DIPHTHERIA.

Fortunately, diphtheria in infancy is a relatively rare disease. The infant's environment is relatively simple, and his chance of infection correspondingly less. Frequently, also, he is born an immune, as experience with the Schick test has amply proved. Nevertheless cases do occur in very early life, and postnasal and laryngeal cases may prove rapidly fatal. (Diphtheria of the conjunctiva may also produce terrible local destruction of tissue.) It is in such cases that Brown and Smith have injected diphtheria antitoxin into the sinus. One would be devoid of imagination indeed did he not think of further serologic possibilities in intravenous therapy; of tetanus, so fatal in the new-born; of epidemic cerebrospinal meningitis; and of severe pneumonias caused by type 1 or type 2 varieties of pneumococci.

THE METHOD.

Incidentally much of the technique has been mentioned in the body of this brief communication. Scrupulous surgical cleanliness should be observed. The scalp should be shaved, scrubbed, and painted with iodine. All instruments must be sterilized. The operator should wear rubber gloves.

Two assistants are needed—one to hold the infant's head steady and slightly flexed; the other to manage the syringe, tube, or transfusion apparatus. Helmholz has devised a needle holder which is supplied with clamps to hold the needle in position and to adjust it at an angle of 25 degrees after its successful insertion. This holder is strapped on the shaven scalp with adhesive strips. A head holder may be employed.

The needle usually employed is a number 18 or 20 (Brown and Smith). We have found a small salvarsan curved needle very useful. Brown and Smith use solder stops on their needles 1/4 to 5/16 of an inch from the tips. This, of course, makes transfixion of the sinus impossible. The needle should be connected with the syringe or other device by a piece of rubber tubing, and in its course should be inserted a piece of glass tubing to reveal blood as soon as the needle is thought to be in the sinus.

CONCLUSIONS.

1. In the study of infantile diseases, blood is frequently needed for cultural or biochemical studies. In the past it was difficult to procure.

2. Intravenous therapy in infantile as in adult diseases is coming to play more and more prominent rôles. Because of the small superficial vessels in infants it has been difficult to pursue.

3. The superior longitudinal sinus is a relatively large vessel, very near the body surface. Its walls are resistant; it is not readily displaced, and it does not occupy anomalous positions.

4. *A priori*, therefore, it would seem to be the ideal vessel to enter, when blood is needed for laboratory investigation, or when intravenous therapy is required.

5. Apparently little danger is incurred in making sinus punctures or injections into blood-stream.

6. No one should puncture a baby's fontanelle without a due sense of responsibility and without a knowledge of method and of surgical cleanliness. Lumbar puncture is a relatively simple and safe procedure, and yet accidents have occurred (hemorrhage into the cauda equina, in brain tumors and in the presence of brain abscess). The mere fact that we possess an important avenue for blood studies and

for injection into the blood-stream should make us guard the method with sedulous care, and should save us from recklessness in its advocation or in its procedure.

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THE CONTROL OF SYPHILIS BY A STATE DEPARTMENT OF HEALTH.

BY EDWARD MARTIN, M.D.,
Commissioner of Health, Pennsylvania.

From the public health standpoint syphilis takes first rank as the cause of crippling and death, yielding in this respect not even to tuberculosis or to cancer. Unlike these two affections, syphilis is so completely and readily recognized, so promptly rendered non-contagious, and, when taken in its early stages, so probably cured that failure to control it is a reflection upon the profession.

Viewing the subject from the purely sanitary standpoint and leaving aside those powerful factors such as environment, education, and morality, which through the ages have been dominant influences in lessening its incidence, if syphilis be treated in general accord with the principles applicable and efficient in controlling other transmissible diseases, it can be eliminated from any community as a factor largely influencing public health.

The method of control adopted by the State of Pennsylvania is as follows: First, the diffusion of knowledge through the State, by means of newspapers, to the effect that an immediate application of antiseptics after contact will largely prevent both syphilis and gonorrhea. Such packages as are practicable, efficient and non-irritating are approved by the State Department, and every pharmacist in the State has been asked by the State Department to keep these packages in stock and to dispense them. The one first approved is a small collapsible tube about the size of the little finger, with a blunt conical end, of such shape that it may be introduced into the urethra. With the tube comes a piercer, by means of which a hole is made in its conical end. Promptly after contact one-fourth of the contents is squeezed into the urethra after urination, interrupted by putting the pulp of the finger several times over the meatus, and after thorough washing of the genitals with soap and water and drying. The remaining three-fourths of the tube contents are rubbed over the external genitals.

The portion squeezed into the urethra is an emulsion of a silver salt, 5 per cent, unirritating to the conjunctiva of a rabbit's eye and strongly bactericidal; the remaining content (3 grammes) is a 30-per-cent emulsion of calomel which forms a disappearing cream.

Every hospital, every physician and every county medical society in the State have been asked to join in the campaign of eradication by: (*a*) Promptly rendering all primary and secondary cases of spyhilis non-transmissible by arsenical injection; keeping them so and probably curing many by appropriate courses of arsenic and mercury. (*b*) Finding in each case of recent

syphilis the source from which it was derived and rendering this source non-transmissible and keeping it so.

The laws of the State call for quarantine in case of venereal infection when the character, occupation, habits or neglect of treatment on the part of the individual endanger public health; to be determined by the patient's physician, or by an officer of the Department of Health.

Quarantine is interpreted as giving the power to either confine to the domicile or to remove to a hospital. Quarantine of the premises of a syphilitic, which has been practiced in many hundreds of cases, often results in jailing of the person infected for breaking quarantine.

The coöperation of the United States Health Department has been asked and is promised in arresting the influx of the fresh venereal cases through the merchant marine.

Surgeon-General Cummings reports an incidence of venereal infection on incoming foreign vessels so surprisingly low and of such variance with accepted belief regarding the sailor as a carrier as to suggest distrust as to the thoroughness of examinations. His statement is made on the results obtained by short-arm inspections.

Since the majority of venereal infections come from houses of prostitution no effort at elimination can be successful unless such places be abolished. This will be accomplished by what are termed Health and Morals Committees formed of the leading men and women of each community, backed by State laws and the large powers of the Department of Health and the Department of Justice, and the dispassionate and efficient help of the State constabulary. These committees act with their local health officer and police, when these agents are sympathetic, before applying to the State.

Raids as usually conducted are brutal, useless, expensive, and may cause wide dissemination of foci of disease.

In the programme laid out for lasting efficiency provision must be made for some thousands of women whose livelihood must henceforth be obtained at no health cost to the community. This is the most difficult part of the problem, solved only in part by existing institutions and organizations for the care and training of the mentally deficient, the wayward, or the criminal.

The State has an organized Venereal Section, thirty-five venereal clinics, each serving as a center for the prosecution of the campaign outlined above, and has officially attached to it many health and moral committees; supplies free to those unable to pay the arsenical preparation; enables all hospitals coöperating (and practically all are so doing) to obtain the arsenical preparation at State rates, a great reduction from the price usually paid, making the treatment comparatively inexpensive; and is not inactive in its educational programme. It has assigned to it by the Interdepartmental Hygiene Board an appropriation and a coöperating force of workers. The State's budget for this work is one hundred and twenty-five thousand dollars a year; this is further increased by grants from the Interdepartmental Board.

GASTRIC RESPONSE TO PASTRY AND PUDDINGS.

MILLER, FOWLER, BERGEIM, REHFUSS and HAWK in the *American Journal of Physiology* for June, 1920, state in their conclusions that a study was made of the acid responses and evacuation times of nearly fifty pies, cakes and puddings in the normal human stomach. The average evacuation time on puddings for all subjects was 2 hours and 18 minutes as against 2 hours and 27 minutes for pies and 3 hours and 2 minutes for cakes. Averaging the highest total acidities, values were obtained for puddings of 92, for pies of 90, and for cakes of 90. Direct comparisons of the three types of foods on the same individuals indicated also that pies were handled more readily than cakes, and pudding somewhat more readily than either.

Fruit pies, such as apple, pumpkin, raisin, and peach, left the stomach in from two to two and three-quarter hours and

developed a moderately high acidity (90 to 100). Most of the acidity is due to free HCl, the acid combining powers of these pies being low. Cherry pie, high in sugar, remained in the stomach a few minutes longer than the above. Rhubarb pie was treated in the same way as fruit pies, leaving the stomach in from two to two and a quarter hours.

Custard pies left the stomach in moderate time (two and a quarter to two and a half hours) and possessed a fairly high acid combining power. Lemon méringue showed a similar response except that the acidity developed more slowly. Mince pies required a rather long time to leave the stomach (two and three-quarters to three and one-quarter hours) and developed high total and combined acidities.

Pie crusts alone remained in the stomach distinctly longer than most whole pies or the contents alone of such pies, and gave a lower but more sustained acid curve. On the other hand, differences in evacuation time of whole pies and the contents of such pies were usually very slight, so that pies with crust, if properly made, could by no means be classified as difficult for the stomach to handle.

The addition of 50 grammes of ice cream to a small piece of pie did not increase the burden of the stomach to any marked extent. The addition of 20 grammes of cheese to apple pie increased the digestion time only a few minutes.

Angel-food cake remained distinctly longer in the stomach than devil-food cake and developed a higher total and combined acidity.

Chocolate layer cake left the stomach in moderate time, acid secretion being depressed by the sugar of this cake.

Fresh and old fruit cakes showed almost identical acid responses and evacuation times in the human stomach.

Strawberry shortcakes left the stomach in moderate time (three to three and a quarter hours) and developed high intragastric acidities.

Lady-fingers left the stomach in three hours, or in about the same time as other cakes.

Gingerbread evoked a rather slow acid response and left the stomach in moderate time.

Cinnamon buns left the stomach sooner than most cakes, but with a similar acid response.

Bread with peanut butter remained in the stomach longer than cinnamon buns and developed a higher acidity.

Bread with corn syrup left the stomach in two and a quarter hours, the syrup depressing secretion somewhat.

Doughnuts remained in the stomach a few minutes longer than crullers. Acidities developed a little more slowly in the case of crullers, due perhaps to the sugar and fat content. These fried cakes required a digestion time but little longer than the average for cakes.

Cookies, in spite of their high content of dry matter, were found to leave the stomach sooner than most cakes, probably on account of their granular texture. Ginger cookies required a little longer than those less highly flavored, and the acid development was less rapid.

Chocolate corn-starch pudding, rice pudding with or without raisins, Indian pudding, bread pudding and gelatin left the stomachs of individuals of the rapid-emptying type very quickly (in one and a half to two hours). Rice pudding with raisins left a little sooner than plain rice pudding.

Cabinet pudding, Brown Betty pudding, cup custard and apple tapioca required only a few minutes longer. Plain tapioca remained in the stomach a little longer than apple tapioca. Plum pudding left the stomach slowly.

The highest total and combined acidities were caused by Indian pudding, bread pudding, and cup custard, all of these being high in protein. The other puddings developed moderate acidities except gelatin, which produced little acid stimulation and left the stomach very quickly.

[These results obtained by experiments carried out in the Jefferson Medical College on volunteer students are somewhat at variance with medical and popular ideas on this matter.—Ed.]

EDITORIAL.

INTESTINAL TOXEMIA.

There are few subjects in which the profession has taken greater interest during the last twenty years than this, and most contradictory opinions have been expressed by men who because of their position as original investigators or teachers are generally considered to be worthy of credence.

So far as the therapy of intestinal toxemia is concerned we have gone through or are going through at least four phases: (1) The purgative phase; (2) the administration of drugs which were supposed to act as intestinal antiseptics; (3) the administration of lactic acid bacilli, which were supposed to be deleterious to putrefactive organisms in the bowel; and last, but by no means least, from the standpoint of radicalism, the theories advanced by Lane and his followers in regard to "kinks" and "veils" and the radical operative measures which, in their opinion, should be resorted to for relief. Perhaps a fifth phase should be named, that is the administration of liquid petrolatum, with the idea that it will act as a laxative, and also with the idea that it will envelop pathogenic organisms, or encapsulate them, and so render them innocuous.

Much of the early work which was done upon so-called autointoxication has been proved to be worthless, but with the advances which have been made in physiological chemistry it would appear that autointoxication in several forms not only undoubtedly exists, but that the causes of this intoxication can be isolated. Thus Graham Brown in a recent issue of the *Edinburgh Medical Journal* deals with intestinal toxemia in the production of hypertonicity of the sympathetic system and points out as the result of much investigation that there are a number of amines which have a selective affinity for the sympathetic neurons, and that these amines are developed as a result of putrefactive changes in the bowel, which putrefaction is usually most marked in the lower coils of the ileum and which in turn induces an ileal stasis which favors infection and absorption of poison.

In this paper he deals particularly with one such poison of the amine group, namely, para-hydroxy-phenyl-ethylamine, which he believes to be the most powerful. He also points out that in health amino acids when absorbed are carried by the blood to the liver, where they are altered, with the result that ammonia is excreted as urea and the fatty acids are used as energy builders. When the amino acids derived from the digestion of proteins are attacked by pathogenic organisms the toxic amines are formed. The diamines he points out are depressors, whereas the particular amine with which he deals, which is one of the monamines, is a pressor agent, or in other words raises blood-pressure.

It is interesting in this connection to note that this pressor agent, the scientific name of which we have already given, has been placed on the market in the form of a phosphate salt under the registered name of tyramine with the idea that it may be employed to raise blood-pressure, the dose varying from 1/12 to 1/2 grain. This substance is considered to have a blood-pressure-raising property about one-twentieth that of adrenalin, according to Graham Brown's statement.

The point which he wishes to emphasize is that this pressor amine, and probably many others closely connected with it, are responsible for abnormally high blood-pressure, and he speaks of cases in which this seems to have been proved clinically and others in which the administration of tyramine has acted in the way described. Although he admits that the manner in which the rise in systolic pressure is induced is not entirely clear, he believes that it is chiefly due to a contraction of the peripheral arterioles resulting from sym-

pathetic stimulation. Usually there is a marked fall in the rate of the pulse, which is what one would expect.

Graham Brown evidently believes that the constant and slow absorption of this amine is responsible for many cases of arteriosclerosis and chronic interstitial nephritis, and he quotes Harvey as having shown that when this drug was given to rabbits intravenously or by the mouth over a period of many weeks there was first developed changes in the aorta, then an arteriosclerosis, and finally a nephritis.

In connection with the physiological action of this amine, Graham Brown found interesting changes in the blood cells as well as in the blood-pressure. It produces a distinct rise in the red blood count, sometimes to 8,000,000, with a rise in the leucocyte count which may or may not be in proportion to the reds. The differential count revealed that the increase was mostly due to lymphocytes, the polymorphs being sometimes increased and sometimes diminished. Although the large lymphocytes were increased, the small lymphocytes suffered the greatest increase.

The point which probably interests our readers most is what can be done to relieve patients suffering from this condition. Before taking this up it may be well to give the method by which Brown determines that this poisonous substance is a factor in the case. He states that it is changed, after absorption into the blood, by the liver into para-hydroxy-phenyl-acetic-acid, in which form it is eliminated in the urine. He employs the method of Mutch as follows: The urine having a specific gravity of 1.015, 50 Cc. is taken, and to this 5 Cc. of 25-per-cent sulphuric acid is added; extracted with 15 Cc. of ether. Evaporate the ether and add 2 Cc. of distilled water and 2 Cc. of Millon's reagent. This is repeatedly boiled and allowed to stand, and according to the amount of the amine present the fluid becomes rose-red, dark-red, or even a deep mahogany brown. Normal urine will give a light reaction with Millon, but the substances which do this are insoluble in ether, and Brown claims if the reaction which he describes is obtained it may be safely concluded that the case is one of intestinal toxemia and that para-hydroxy-phenyl-ethylamine is the agent which is active.

Returning to treatment, he believes that protein foods should be largely cut out of the diet and reliance placed upon the starches, milk, butter, fruit, and vegetables, since the poison comes chiefly from the putrefaction of animal foods. In some instances the use of hydrochloric acid with meals is advantageous. He also strongly advocates the administration of liquid petrolatum, as he believes, with Leonard Williams, that it limits the absorption of toxins. He also advises the use of carefully prepared autogenous vaccines and thinks that thymol is probably the most effective intestinal antiseptic that can be used. He gives it in doses of from five to ten grains twice daily, reminding us that great care must be taken to avoid the use of such solvents as glycerin, fats, and alcohol during the time that it is being taken. Of other intestinal antiseptics he recommends gray powder in small doses and beta-naphthol given alone or separately.

THE ADMINISTRATION OF DIGITALIS.

There is no drug, unless it be quinine, which depends so much for success in its administration as does digitalis. If given in too small a dose it may be useless; if given in too large a dose it may be toxic, and as different individuals vary in their susceptibility to it, the question of what is a toxic dose cannot be answered definitely.

As we have pointed out before, the English physicians as a class are probably more correct in their use of digitalis than many American practitioners, since they recognize that in many instances the best results are obtained by giving from one to six full doses and then maintaining the effect by much smaller ones or stopping the drug entirely for a few days. This certainly is the method which is to be preferred in most cases of ruptured compensation if

the patient can be kept at rest. Full doses, beyond one or two at least, should not be given if the patient is allowed to go about.

It is not only important to remember that digitalis is a drug which is very slow in producing its effects, but also that it is very persistent in maintaining them, and that when once its full physiological action has been developed it probably maintains its influence to some degree for at least seven days.

Various estimations have been made in order to determine how large a dose can be given with safety, and it has been claimed that a dose equal to two minims to each pound of body weight is sufficient to produce mild toxic manifestations. The difficulty with this estimate, as already pointed out, is that patients vary so greatly in their susceptibility. Certainly the administration of five drachms of tincture digitalis to a patient weighing 150 pounds would result in an excessive digitalis effect in a very large number of people, and we have always held that while a full and definite digitalis effect is necessary in many cases, it is equally important that the patient should not be poisoned by the drug.

Pardee contributed an interesting article upon this subject to a recent number of the *New York Medical Journal* and expressed the view that the average rate at which the body disposes of digitalis is equivalent to 22 minims of the tincture a day, but here again the ability of each individual to deal with the drug varies widely.

It has been held by some that the drug should be pushed to the point of inducing nausea and vomiting. This comes on much more rapidly in those who are permitted to move about than in those who are kept quiet. We cannot help feeling that the patient who receives digitalis in such doses as to induce these two symptoms has been poisoned by it, and that any good which may be done to his heart is more than counterbalanced by the disagreeable character of his symptoms and by the strain which is placed upon his heart in the effort of vomiting.

In our experience an examination of the heart from day to day will warn the physician when he has given enough digitalis because of the deliberate character of the beats or because of the induction of irregularities due to premature contractions or missed beats due to block.

While it is true that some patients require very large doses at the start, it is also true that digitalis may also be used as a tonic to the heart in cases in which it is tired and feeble but where there is no true rupture of compensation. In such instances there is no necessity, nor is there any wisdom, in administering massive doses. Five minims of the tincture three times a day, continued for a considerable period of time, often in association with moderate doses of Fowler's solution, will prove most advantageous; or ten minims may be given night and morning for the same purpose, although in susceptible persons it not infrequently happens that after 20 minims a day of the tincture have been used for two or three weeks an excessive action of the drug manifests itself.

Above all other drugs, as we pointed out at the beginning of this note, it is essential that the administration of digitalis shall not be by routine, but be governed by the peculiarities of each individual patient, and, furthermore, it is to be remembered that digitalis is a drug which while capable of doing great good is, if it is wrongly administered, capable of doing great harm and even of causing death, although the dose given on the day of death may be, according to a dose list, entirely within bounds.

THE VALUE OF ALCOHOL AS A THERAPEUTIC AGENT.

The title of this editorial has probably been printed thousands of times. Nevertheless it covers a matter of extraordinary interest, and no less a body than the Section on Therapeutics and Pharmacology of the Royal Society of Medicine of London has recently employed it.

The President of the Society admitted that he could discuss the subject only from

the standpoint of the pharmacologist, and stated that he would leave the consideration of the therapeutics of alcohol to those who had practical experience. He was skeptical of the importance sometimes attributed to the minute traces of ether and other constituents of wines and distilled liquors, but he announced, very positively, that in his opinion there was no doubt that alcohol has a value as a food, as well as a value as a drug, yielding energy to the body practically immediately after its ingestion and taking the place of an equivalent of starch or fat in this action. He did not go so far as to commit himself to the view that alcohol is a desirable source of energy for the body of the healthy person, but in certain conditions there is no doubt of its advantage since it requires no digestion, is rapidly and completely absorbed, and not susceptible, as are carbohydrates, to fermentation by yeasts and the action of bacteria. For these reasons it is able to supply to a system which is temporarily unable to obtain it from normal sources the minimum of energy necessary to enable it to carry on, and tide over, a critical period. In connection with its employment as a so-called stimulant, Dale admits the correctness of pharmacological research, which indicates that it is not a stimulant in the ordinary sense of that term, but it does affect the circulation very materially, dilating the superficial vessels and in many instances restoring circulatory equilibrium.

We are interested to note that Dale emphasized the importance of differentiating between results which are obtained by the ingestion of alcohol on the part of normal animals or man and its employment in those who are ill, and that its habitual use in treating syncope and collapse is not due to a stimulant effect but to a removal of severe central inhibition. This seems to him to be the explanation of its value, and in pneumonia he appears to think that abnormal reflex irritability of the respiratory center impairs the oxygenation of the blood, and that alcohol by restoring a quiet, deep, effective respiration ought to be of use.

On the other hand, Dale has no confidence in the view that alcohol is a sort of specific against infection, particularly influenza.

In the discussion which followed, Mellanby, who has done such excellent experimental work for the British Control Board, Liquor Section, after quoting Atwater and Benedict's classical experiments, exhibited a series of curves based upon experiments made upon dogs, demonstrating the rapidity of absorption of alcohol in various dilutions and the rapidity with which it was oxidized in the body. These experiments of Mellanby, while of great interest and importance, have recently been supplemented or displaced in value by the investigations carried out by Marshall in this country upon human beings, his conclusions being, of course, the more dilute the mixture of alcohol and water the slower the rate of absorption.

Mellanby also showed a curve, the result of an experiment upon a man weighing about 140 pounds, by which he calculated that the subject oxidized 10 Cc. of alcohol per hour and that the rate of disappearance of alcohol from the blood almost certainly represents its rate of oxidation.

Discussing alcohol as a digestive stimulant, Hutchison stated that there was a general agreement amongst clinicians that alcohol is undoubtedly a food of special value, particularly in diabetes and prolonged fevers; that it is a digestive stimulant often useful in cases of impaired appetite, gastric atony, and in convalescence; that it is also useful as a carminative in severe cases of flatulence; that its effect in dilating superficial blood-vessels is of use in combating the effects of a chill, as well as in rigors; and that it has value in helping to reduce blood-pressure during an attack of angina. The drug also is of value because of its narcotic action in some cases of insomnia, especially in old people and in the delirium and restlessness of acute illness. Hutchison believes that its value in acute heart failure, as in syncope, depends upon its reflex stimulating effect. By quieting restlessness it is also indirectly of value to the circulation. His view is

also that there is some reason to believe that in septic infections it increases vital resistance, a fact that the writer proved some years ago.

No less a well-known authority than Hale White agreed practically with all the views so far expressed. A glass of wine taken with a meal he thought was advantageous when a patient was weak and "on edge." It would not only quiet him and promote digestion, but do no harm, and he said he had never known an alcohol habit formed from taking it during convalescence.

Using scientific terms he cleverly summed up the views of many other human beings when he stated that the chief therapeutic value of alcohol was as a pleasant depressant peculiarly efficacious in inhibiting peripheral sensations such as slight pain and discomfort, and by its slight cerebral depressant effect so diminishes the trivial worries that bother the sick.

Concluding his remarks, Hale White stated the well-known fact that brandy was the best alcoholic preparation in diarrhea, and that old brandy had superior therapeutic effects over that recently made.

Leyton, discussing the value of alcohol in diabetes, showed from clinical experience that its addition to the diet greatly increased the energy of a patient, enabling him to take more exercise and to gain weight.

Langdon Brown expressed a view in accord with Leyton, and also said that it was his belief that it increased the secretion of the gastric juice, that it added to the patient's comfort when ill by removing nervous irritation, and he agreed with Willcox's view that the administration of oxygen gas passed over brandy contributed to the recovery of some cases of pneumonia.

Esther Harding in concluding the discussion stated that in the case of children the uses of the drug fell under the same headings as in adults: (1) In respiratory embarrassment, especially the rapid, shallow, inefficient breathing of bronchopneumonia, alcohol quieted the respiration and so made it more efficient. It was true that the indication for the use of alcohol was commencing failure of the right heart, but the effect of the drug was not to flog the already overburdened heart, but to relieve it of some of its intolerable burden by slowing the respiration and improving the oxygenation of the blood. (2) Alcohol was, in her opinion, the most valuable sedative and hypnotic drug we possessed for infants and young children. (3) As a food in cases in which no ordinary diet could be taken: (*a*) in milk intolerance of marasmic infants alcohol would sometimes tide a patient over a few days till milk or whey tolerance could be reëstablished; (*b*) in the persistent late vomiting which killed so many patients after severe diphtheria. She has kept a child alive on more than one occasion under such circumstances on saline, brandy, and sugar, given by the stomach, for three weeks. A word of warning on the danger of the persistent use of alcohol in young children was hardly needed, and it is wise to remember that small doses of spirit given to an infant over a period of weeks might easily result in damage to the liver.

ACUTE APPENDICITIS.

Under this title at one time the medical journals were flooded with comments, case records, and studies of large groups. At the present such papers as appear have mainly to do with the question of diagnosis, at times extremely difficult when the inflammation is post-colonic, or with final results, it being assumed, at least in this country, that appendicitis once diagnosed is to be immediately operated upon, and, where this procedure is followed, the operation is safe, the mortality low and, providing the surgeon has confined himself to the removal of the diseased organ, the cure complete.

Flint (*The Practitioner*, May, 1920) reports 370 cases of acute appendicitis upon which he operated. He observes that there is no acute abdominal condition which is

easier to diagnose. This statement requires qualification. A typical case is unmistakable, though an atypical one may be beyond the skill of the most experienced surgeon. The latter variety is rare. Acute inflammatory cases were characterized by red, swollen, stiff appendix with a little roughness of the peritoneal coat, and usually the peritoneum contained turbid fluid. Sometimes the appendix showed a distinct constriction, the distal part being tightly distended and always inflamed. This occurred in 176 of Flint's cases; they all got well. In gangrenous cases, of which there were 17, all recovered but one. His perforating cases numbered 158, with 18 deaths.

He comments with some feeling upon the now well-recognized fact that anything beyond the stage at which acute inflammation is present should be regarded in the light of a complication which it is a reproach for the medical attendant to allow to develop. The pathology of the affection he regards as a combination of obstruction of the lumen of the appendix, and infection behind this. He believes the lumen is always more or less obstructed before an attack of acute inflammation occurs. Partial or complete stenosis precedes the acute attack with previous slight inflammation. There is no doubt but that the normal appendix can empty itself entirely and painlessly, but, when some stenosis has occurred, fecal material which squeezes through the cecum is retained, at least in part, and, mixing with the secretions from the appendicular wall, eventually becomes inspissated and molded into well-known concretions. When a concretion has formed, the train is laid for an acute attack of appendicitis. The appendix, in attempts to rid itself of its contents, drives the concretion into the narrow lumen. It becomes impacted. This gives rise to acute abdominal pain, colicky in nature, later becoming constant, but the really serious results arising from the effects of retention behind the impaction are increased bacterial activity, pressure anemia, and necrosis. In the author's series of cases 89 developed abscesses, 58 of which were in the pelvis. Ten of these had other abscesses as well, eight of which were in the right loin and two at the root of the mesentery. The other 31 of the 89 cases of abscess were purely other than pelvic; the majority were behind or to the outer side of the cecum, and varied in size from an ounce or two of pus just above the pelvic brim, or lying in the right kidney pouch, to an abscess filling the whole of the loin as far as the under surface of the liver.

There was a not infrequent association of two or more abscesses. Pelvic abscesses were found when the appendix had been lying with its tip in relation to the kidney, even though there had been no abscess in the latter situation. It was probably due to the protective fluid which was poured out freely in the early stage of the acute appendicitis. This gravitated to the pelvis. Probably many of these collections were absorbed, but occasionally they became infected from the limiting intestinal coils, and required drainage.

Left-sided abscesses were uncommon apart from a general peritoneal infection. Among the 33 cases of peritonitis, either widely local or generalized, there were eight deaths, commonly in children.

Rigidity in them was frequently misleading, but at times absent. There were six cases of acute intestinal obstruction in the series. In two it was present at the time of operation; both recovered. The other four postoperative, three dying. Adhesions were the cause. Usually they form a complex matting of coils. Postoperative obstruction was definitely mechanical and not merely paralytic.

The author concedes the value of two or three hours saline infusion subcutaneously and rectally, also the necessity of washing out the stomach and repeating if necessary. This for cases of obstruction. The youngest case was six months old; the oldest was sixty-six years. In the whole series there were 19 deaths (5 per cent).

Diagnostic errors are mainly those connected with the symptomatology of acute salpingitis. Attention is called to the sim-

ilarity of symptoms in the cases of acute pneumonia, perforated duodenal and gastric ulcers, some cases of diverticulitis, acute cholecystitis. Pyelitis has also been the cause of wrong diagnosis. Where no abscesses are formed the wounds are not drained. Vertical incision was used, displacing the rectus inward. Patients are placed in the Fowler position; saline is administered to those who have had the complication of perforation. The bowels are moved toward the end of the first twenty-four hours. It is stated that secondary abscesses are not uncommon. Large pelvic collections may be drained by the rectum or vagina. Most cases recovering from operations are usually completely cured. They may return complaining of indefinite pain, which is probably due to incompletely absorbed adhesions. A certain small number complain of dyspeptic symptoms which they had before the acute attack.

THE CONTROL OF CANCER.

Physicians have long since ceased to take an active interest in such a title, since it is recognized that the subject-matter following is usually a vague discussion, sometimes a collation with no attempt at correlation of facts not distinctly associated, exceptionally a term without the faintest foundation other than observed clinical cases. None the less, since it has become a public health menace it is increasing in prevalence, and to quote Van Beuren (*Medical Record,* May 1, 1920) last year killed more than 61,000 people in the United States in the registration area alone. It does no harm to bring forward again and still again means by which if not controlled its destructive effect may be markedly limited. It is with this in view that in Pennsylvania, at least, cancer days have been established, days on which the whole question of prevention is discussed publicly by those fitted to discuss such questions, and in the presence of the most intelligent members of the community.

Wainwright's oft-quoted statistics are to the effect that in so far as mortality is concerned a large percentage of cases perhaps could have been saved by an early diagnosis, which should have been made by any well-trained physician who has habited himself to the careful examination of each case which comes to him. Therefore in so far as the medical profession is concerned the most important single factor in lessening both morbidity and mortality is that dependent upon the careful examination by intelligent men. Wainwright's studies as quoted by Van Beuren show that about half the cases had some precancerous condition such as ulcers or uterine tears. So that one-half of the cases that applied to the surgeons might never have had a cancer had they known the significance of this precancerous condition and had it remedied before cancer developed.

Gibson has stated on the basis of 110 cases of cancer cared for at the New York Hospital that, because of the advanced stage of the disease at the time they reported, 93 per cent offered no possibility of cure whatever. He further stated that at least 50 per cent of these cases had received no advice or treatment based on recognition or even suspicion of their condition. Gibson held the profession directly responsible for a large proportion, perhaps the majority, of lost opportunities to properly treat precancerous conditions. This was based on the cases received from February, 1913, to April, 1915. It is wise to repeat to the profession and to the laity again and again the advice given by the American Society for the Control of Cancer as follows:

Do not neglect the treatment of persistent ulcers, sores, cracks upon the lips, cheeks, tongue, or any other part of the body.

Have removed any wart, mole, or birthmark just as soon as it shows any evidence of growing larger.

Have removed any such growth, in any case, if its situation renders it liable to continued irritation.

Do not neglect the treatment of chronic indigestion.

Secure early treatment for irritating discharges from the uterus or vagina, and have

any injuries due to childbirth promptly repaired.

Have any broken or decayed teeth repaired or extracted.

Consult a competent physician or surgeon twice a year for possible symptoms of cancer.

Insist on getting a thorough examination when you go to a doctor for advice as to a possible cancer.

Consult a competent surgeon for any chronic indigestion, vomiting of blood, or bleeding from the rectum, or blood noticed in the movement of the bowels. These are things which must not be neglected.

As a proof of the value of such propaganda Van Beuren states that some thirty years ago the statistics showed that cancer mortality had increased, in a part of Northeastern Germany, about 100 per cent during the preceding twelve years. An educational campaign similar to ours was instituted, and ten years ago a definite reduction in the cancer mortality became observable. In the six years prior to the war the reduction had reached a point 15 per cent below their highest mortality figures.

Knowledge is power, but only if used wisely, if the truths enunciated will be applied to the lessening of human suffering. This remains problematical. Of the many thousand doctors who have read, are reading, and will read with approbation the advice given by the American Society for the Control of Cancer there will be at least 5 per cent who bear upon their own person recurring ulcers, inflamed warts, growing pigmentations, areas of keratosis, and other precancerous manifestations to which they have not, do not, and will not pay the faintest attention. A further hope in regard to the cancer control lies in the use of radium and the *x*-ray supplementing the work of the surgeon.

REPORTS ON THERAPEUTIC PROGRESS.

TRANSFUSION OF BLOOD IN PERNICIOUS ANEMIA.

In the *Edinburgh Medical Journal* for May, 1920, Graham reaches these conclusions on this subject:

1. Transfusion of blood is of considerable value in cases of pernicious anemia which have failed to respond to all the usual medical measures. It may alleviate, but cannot cure, such cases.

2. The ideal method of transfusion is either direct from artery to vein or, preferably, indirect transfusion from vein to vein. Anticoagulant substances should not be used when methods of transfusing unmodified blood are available.

3. A large amount of blood is unnecessary, owing to the risks of overtransfusion and to the fact that the benefit conferred by transfusion is not necessarily in proportion to the volume of blood received.

4. A repetition of transfusion should be considered when the symptoms relapse, or if the first transfusion fails to produce the desired effect.

5. The dangers associated with transfusion are small when the modern technique for transfusion is used, and especially if preliminary tests have been made to exclude the risks of hemolysis.

6. Transfusion is not to be regarded as an alternative to other forms of treatment, but as a therapeutic agent in reserve, available when the usual measures have failed.

7. The benefit resulting from transfusion may be only slight and temporary, or it may be continuous and a fresh period of remission from the anemia may be initiated.

8. The prospects of benefit are greater if the transfusion is not postponed till the patient is critically ill and in immediate danger of dying.

9. Even in apparently exhausted cases, regarded as hopeless, and whose death appears to be imminent, transfusion occa-

sionally will resuscitate the patient in a remarkable manner.

10. Transfusion will initiate a fresh remission in 43.4 per cent of cases in which the anemia has been progressive or has failed to respond to medical treatment, including arsenic.

11. When the patients are critically ill at the time of transfusion, having failed to respond to treatment including arsenic, a fresh remission follows in 28.5 per cent of the cases.

12. When the patients are seriously but not critically ill at the time of the transfusion, having failed to respond to treatment including arsenic, a fresh remission follows in 50 per cent of the cases.

13. The results of transfusion are always uncertain in any given case.

14. Cases of an acute type and cases with marked pyrexia, or a history of hemorrhages, are least likely to benefit.

15. The immediate effects of transfusion are often striking. Signs of improvement are noted in the color, mental alertness, pulse, blood-pressure, and in the appetite. The patient frequently feels better and stronger.

16. Symptoms of nausea and vomiting are occasionally almost at once relieved and the patient is better able to take nourishment.

17. Arsenic occasionally is better tolerated and frequently is more effective after transfusion.

18. The onset of a remission following transfusion is due to reaction of the bone-marrow.

19. Fresh activity on the part of the bone-marrow may possibly be due to dilution of toxin or to direct stimulation of the marrow, but is more probably a result of the general improvement in nutrition, following upon transfusion and the more effective exhibition of arsenic.

20. There is little evidence that a single transfusion of blood will continue to stimulate the bone-marrow and to diminish the anemia, unless arsenic is continued.

21. The advisability of transfusion should be considered, but the results are not sufficiently consistent or permanent to justify it being urged, in all cases of pernicious anemia which are stationary, progressive, or critically ill, in spite of the usual means of treatment.

MEDICAL TREATMENT OF INFANTILE PARALYSIS.

MACKAY, in the *British Journal of Children's Diseases* for January-March, 1920, states that to achieve good results diagnosis and treatment must both be as early as possible, and the outstanding lines of treatment are complete anatomical rest and muscle reëducation.

The treatment for any paralyzed muscle is immediate rest; but that alone is not sufficient—it must not only be immediate but also anatomical. It must be immediate because the disease at once destroys muscle adjustments, and so fine are these that immediately the nerve-cell governing the action of a flexor, for example, is affected its extensor opponent begins to overact, and this must be prevented for three reasons:

1. It does not allow complete rest of the affected anterior horn cell, being a constant source of irritation.

2. By overstretching the affected muscle it interferes with its recovery.

3. Even though the nerve-cell and affected muscle may recover their power, deformity is inevitably produced.

No definite time can be stated as to when muscle reëducation should be begun, but the guides will be pyrexia, pain, and tenderness; until the cessation of these the limbs are best kept rested only.

The great underlying principle is to pick up a minimum function and to use it as the commencement. There is a zero position of muscle function for every muscle or muscle group; reëducation must be commenced in this position, and carried on patiently and skilfully during the next two years at least.

It is impossible to say when improvement

is no longer obtainable. Lovett reports a case of twenty-five years' standing, Mackenzie one of eleven years, and he has seen marked improvement in a left upper limb with a nine years' history.

Thymus gland has been advised in doses of 5 gr. three times a day, but it is difficult to be sure of the resulting benefit obtained by its administration.

Massage and electricity, the sheet-anchors of former methods of treatment, are considered by modern authorities to be not only useless but harmful in the early stages of this disease, and after that should be used with discretion to strengthen recovering muscle function, with reëducation, as always, the prime curative factor. Warmth for the limbs under all circumstances is a necessity of treatment.

SYPHILIS IN DISEASES OF THE HEART AND CIRCULATION.

CHAPMAN, in the *Lancet* of May 8, 1920, states that when a patient with organic heart disease comes before us and there is no history of the more usual infections syphilis should be suspected and confirmatory evidence diligently sought for, especially in patients at or after middle life. When the cardiac symptoms are not urgent it is advisable to prescribe a period of rest, together with a short mercurial course, before proceeding to the administration of the more direct cardiac remedies.

NOVOCAINE ANESTHESIA.

GRIFFITHS, in the *Lancet* of May 1, 1920, apologizes to the experts if any points mentioned in his paper on this subject seem to them elementary. He makes no attempt to describe details about injection or sterilization of the solution used, as these and other equally important matters can be found in the larger text-books on the subject. In his criticisms it might be thought that he was unfavorable to operating under local anesthesia. He states that the object of his criticisms is only to warn novices against the many avoidable pitfalls. He believes that some day, when "nerve blocking" is better understood, any operation will be carried out under novocaine in order to avoid the always present risks of general anesthesia. No one who witnessed the scores of resections for empyema at Haslar Hospital during the late scourge could doubt the brilliant future of local anesthesia.

An exceedingly important detail from the surgeon's standpoint is the careful preparation of the novocaine solution previous to injection. As this is frequently dispensed by men unfamiliar with asepsis, the risk of possible sepsis in the wound after operation must be considered. A "clean" but "septic" glass stopper or bottle may result in many heart-burnings.

Another difficult and delicate subject that is apt to arise is the anesthetist's surgical cleanliness. Anesthetists can grow careless over their asepsis in administering subcutaneous injections. Granted that these two extremely important points are attended to, the mode of injection may now be briefly described.

The use of novocaine solution in 2-per-cent and 5-per-cent strengths is recommended by various authorities. In experiments at Haslar Hospital perfect anesthesia was obtained with 0.5-per-cent solution of novocaine, and this strength was adopted as routine for all operations performed under local anesthesia. Each ounce of the solution had 5 to 10 minims of adrenalin (1:1000) added to act as a hemostatic. These local measures were supplemented by a hypodermic injection of scopolamine gr. 1/150 and omnopon gr. 1/6 about fifteen minutes previous to making the incision. This was sufficient to make the patient dazed or extremely sleepy. Occasionally a larger dose might have been given with benefit. The advantage of administering the hypodermic of scopolamine and omnopon, especially in nervous and apprehensive patients, is indisputable.

To operate really successfully under novocaine requires more precision, neat-

ness, and surgical skill than under general anesthesia. A rough and clumsy operator can never succeed, except in frightening and giving considerable pain to his patient. Perhaps the most vital point to remember is the exact limits of the area of anesthesia. For this the closest coöperation with the anesthetist is essential to prevent the patient suffering unnecessarily. There are also certain characteristic minor difficulties which practice can alone render familiar. For instance, following the cutaneous incision, the underlying tissues never look normal owing to a peculiar edematous and mucoid appearance of the fat and muscle. To this may be superadded an unnatural blanching of the same structures if adrenalin is used with the novocaine solution. These masking and deceptive appearances may result in anatomical errors being made until the operator is familiar with them.

Again, the non-relaxation of muscular tissue is bound to hamper the operator both in his speed and manipulations. In reference to speed, his average time for a Bassini's radical cure of hernia is fifteen to twenty minutes, but is increased through the difficulties already mentioned to twenty-five to thirty minutes under local anesthesia.

The special postoperative complications may be divided under two headings: (1) Local; (2) general.

1. In this group reactionary hemorrhage must be mentioned. Griffith met this complication in a small percentage of cases operated on, although the proportion was always higher than with general anesthesia. The hemorrhage was never alarming nor serious, but varied from an extensive ecchymosis of the skin around the incision to a fair-sized hematoma in the cellular planes. Reactionary hemorrhage always ocurred in novocaine anesthesia to which adrenalin had been added, the hemostatic properties of the adrenalin being so effective that it occluded temporarily even the smaller-named arteries and veins. The occlusion obviously was due to vasomotor constriction, and not to thrombosis, as he has often seen the blanched gaping ends of the small arteries pulsating, but showing no vestige of clot in their lumina. Eventually the vasoconstriction passes off, with the liability to reactionary hemorrhage from the smaller-named vessels unless ligatured. There are two ways to prevent the possibility of this complication: First, to withhold the adrenalin altogether. This is certainly the safest method to avoid reactionary hemorrhage. It is a curious fact that primary hemorrhage in the incision is far freer with novocaine alone than with a general anesthetic. The alternative remedy is to rub any probable sites of small-named vessels to promote hemorrhage with a view to applying a ligature to each unruly point discovered.

Another phenomenon that appeared in practically all the cases operated on was a serous discharge from the incision. This usually ceased about the seventh or ninth day. In itself the discharge is unimportant as regards the future scar, except possibly when Michel's clips are used. In these wounds the cutaneous margins are approximated so closely that no serous exudation can escape. Serum collects in the field of the operation, and is further increased by osmosis from the neighboring tissues by the salts of novocaine and adrenalin remaining in the tissues after operation. In time the tension produced along the line of clips results in the Michel clips being torn out or displaced. The mechanical irritation produced, together with the fact that it is impossible to swab the incision with iodine owing to the presence of the steel clips, may result in sepsis of the wound at a later date. The palliative remedy of removing a clip or two does not enhance the beauty of the scar. It is far better not to use Michel's clips at all. The last local complication to be mentioned is the presence of intense pain in the site of the operation which comes on some hours after the operation.

2. Alleged insomnia was so common among his patients that it was proverbial for each patient to state next morning that

he had not slept a wink. The nursing staff had special orders to look out for insomnia, but the general rule was for patients to sleep for several hours the night after their visit to the theater. Intense headaches were also noted in a few cases. Rather severe pain was often complained of in the lumbar region, especially with inguinal operations. The theater table was usually blamed for this symptom, although localized nerve shock may explain this more accurately. Thirst as a symptom was frequently present during the actual operation, whereas flatulence appeared equally commonly on the following day.

Retention of urine was far commoner after novocaine anesthesia than after similar operations performed under a general anesthetic, the frequency of the retention depending partly on the roughness of the surgeon in handling the parts.

Reference must be made to chest complications. During the years 1918-19 there was quite a long series of cases with coughs and bronchitis at Haslar Hospital following general anesthetics. It was partly to avoid chest phenomena that he adopted local anesthesia so frequently. Whether the years mentioned were especially prone to coughs and colds he does not know; but the number of chest complications under novocaine anesthesia were almost as great as those that followed general anesthesia. An interesting but curious postoperative symptom was the appearance of a definite but slight tint of jaundice in the conjunctivæ. The jaundice set in always on the second day after the operation and occurred in at least 30 per cent of cases. It eventually disappeared at the end of the week. It never extended to the skin nor other mucous membranes. The feces were of normal color, whilst bile-pigments could never be found in the urine. The pathology of this condition requires investigating, as only two similar cases followed general anesthesia.

Lastly, there are two or three operations that require special mention. In performing radical cure for hernia no painful stimuli need be felt by the patient until the neck of the sac is reached. Any pulling on the neck almost always produces a momentary painful sensation for the patient. The pain is never unbearable, and can be greatly reduced by gentle handling. In operating for varicose veins it is doubtful whether the addition of adrenalin is a help to the operation. Comparatively large veins, even an internal saphena, are so reduced in size by vasoconstriction that some doubt may be expressed as to whether a small branch is being dealt with instead of the original vein to be operated on. For hemorrhoids novocaine anesthesia cannot always be relied upon to give perfect anesthesia. To this must be added another handicap, the non-relaxation of the sphincter ani.

LOW CANDLE-POWER LIGHT THERAPY.

KINNEY, in the *American Journal of Electrotherapeutics and Radiology* for May, 1920, in writing on this subject gives the following technique, first directing that a hood of some fabric be built over the bed to retain the heat.

Choosing a bulb that meets the needs of the individual is of greatest importance. Just as individuals differ in the amount of bed-covering required, so do patients differ in the amount of candle-power to be used. A good rule to follow is to try, as far as possible, to produce the same degree of warmth as the patient is used to having by means of bed-covering. In selected cases of orthritis or neuritis, it is often advisable to increase the radiant light and heat to such an extent that the skin will appear moist. If this reaction is desired, the draperies will have to be reinforced or else the following phenomena will take place:

At just the moment the sweat glands begin to open, the colder air striking the thin draperies apparently comes through in just the right proportion to produce a cooling of the patient's skin, and chillness ensues. This will not happen if thicker

draperies are suspended just outside the original ones. He has used tungsten bulbs ranging from 40 to 100 watts.

Regulating the distance from the hood to the patient's body is also important. The distance is measured from the bottom of the hood to the patient's body and ranges from eight to sixteen inches.

Preparation of the patient is very simple indeed. Usually the patient is perfectly naked, but many times they merely pull their night-clothes up around their neck, roll up their sleeves above their elbows, tuck the draperies around them until just their head protrudes, turn on the light, and they are ready for a night's sleep; knowing well that all through the night hours their whole body will be exposed to a moderately strong artificial sunlight, much as if they were lying out on the sand at the seashore, but minus the wind blowing on the body and the strong chemical rays which produce the blisters and burns. Should the patient desire to turn over he may do so, as it will not interfere with the draperies, and this only exposes different parts of the body.

The length of exposures is limited only by the patient's tolerance and number of hours in a day. Some patients take kindly to them almost immediately and look forward to the exposures with pleasure. Others are nervous, and at first two or three hours is about all they can stand. As they get the right bulb and are more used to lying in the bright light they will soon fall asleep and forget all about it until morning. So far, he has not been able to note that any special type of case needed any longer or shorter exposure. While the painful cases of arthritis and neuritis will not only tolerate but demand a greater degree of radiant heat, they need no longer exposures than do the generally run-down nervous cases or those with anemia. While the walking patients used the hood only at night, about six to eight hours, certain bed patients will lie in this atmosphere of sunshine nearly if not quite the whole twenty-four hours.

While designing his hood Kinney had but two types of cases in mind. First and foremost he wished a more powerful weapon with which to combat anemia than any he possessed; and secondly, he desired an apparatus by means of which he could expose his general arthritis cases to the general action of artificial sunlight. In pernicious anemia and the idiopathic type which closely verges on the pernicious, in addition to the arc baths, leucodescent lights, oil rubs, massage, medicine, etc., he now uses the universal hood exposures from twelve to twenty-four hours daily. His data of these cases is incomplete.

In severe cases of arthritis, accompanied by anemia and extreme emaciation, in which most of the joints of the body are involved, this hood is clearly indicated. While the small especially constructed hoods are of great value in this type of case, still it takes many of these hoods to cover all of the joints, while the universal hood not only covers every joint, but the whole body is exposed to the heat rays, which for many hours at a time are penetrating into the blood stream, producing an effect the efficacy of which cannot be questioned.

He believes that by means of this universal hood we shall have an apparatus of great value in the treatment of arterial hypertension. Light from its action on the tissues should be of the greatest benefit in the lowering of blood-pressure. He is at present experimenting with the universal hoods on this type of cases, and it looks as if some very pleasing results might ensue. The great factor in blood-pressure is resistance. This resistance may be in the internal organs, as the kidneys and thyroid gland; or in the arterial system. In the earlier stages of arterial hypertension, the great causative factor is autointoxication, the absorbed toxic products producing a contraction of the capillary walls, reducing their caliber and thus increasing the tension and raising the pressure as registered by the sphygmomanometer. Now we know that light according to its wave lengths penetrates to a considerable depth and there loses its radiant qualities, but at the same time heat is generated. Thus we have in a

greater or less degree a hyperemia produced with a dilatation of the capillaries and a relaxation of all the tissues exposed. This capillary dilatation with its tissue relaxation and increase of metabolism must of necessity produce a lowering of blood-pressure in the localized areas exposed to the action of light. If that be the case, and the whole body be exposed under a low power light with its varying degrees of penetration, is it not correct to suppose that the same reaction which takes place will produce a general lowering of an arterial hypertension throughout the body?

HYPERCHLORHYDRIA—A FREQUENT CAUSE OF DEFECTIVE APPETITE IN CHILDREN.

In the *Medical Record* of May 8, 1920, KERLEY states that the type of patient considered is the older child, whose appetite is poor in consequence of a condition of hyperchlorhydria or hyperacidity with its accompanying symptoms. The history most frequently obtained is that in the feeding intervals the desire for food is very marked, in fact at times almost voracious, the child being unable to wait until meal-time. He starts the meal very well, but after taking a small quantity of food his appetite is quickly satisfied, and he turns away thoroughly appeased. This is repeated time and again, with the same intense initial desire, and the same rapid appeasement.

After eating there is complaint of a feeling of fulness in the epigastric region, often accompanied by indefinite pains in the region of the umbilicus, which may radiate to the right inguinal region, simulating a chronic appendical pain. Accompanying or shortly following this sensation of discomfort are acid eructations of gas, with the resulting heartburn, and burning in the stomach.

The duration of the acute symptoms is variable, disappearing usually in the course of an hour. The breath of these children is usually offensive and the tongue coated. Constipation is the rule. In appearance they are apt to be anemic looking, with sallow complexions. They are moderately under height and under weight, tiring easily on exertion, and they do not have the ability to withstand physical stress. Examination of the gastric juice reveals an increase of both free hydrochloric acid and total acidity.

The prognosis is very favorable for the relief of the immediate symptoms, and if the proper dietetic and hygienic measures are instituted and followed no subsequent trouble is to be anticipated.

The dietetic history usually obtained from the parents in these cases is that the juice of one or two oranges has been given the first thing in the morning, followed by a breakfast of one or more eggs daily. For the midday meal a highly seasoned soup has been given, or red meat, such as steak or roast beef, has been eaten daily or every other day. In like manner ice-cream has formed a favorite dessert. Oftentimes tea or coffee has been constituted an important part of the diet. Between meals candy has been eaten *ad libitum* and ice-cream sodas indulged in frequently.

In the treatment alkalies are given to neutralize the excessive acidity. A prescription such as the following, given in water fifteen minutes before each meal, has been found very effective:

℞ Magnesium carbonate, gr. xxx;
Sodium bicarbonate, gr. j;
Bismuth subcarbonate, gr. j.

M. Ft. chart No. xxx.

For the constipation a rhubarb and soda mixture combined with aromatic extract of cascara, in one- to two-drachm doses at bedtime, is indicated.

The diet plays a very important part in the prevention and cure of this condition. The mother is instructed to see that the child has nothing very hot or cold, very sweet or sour. Everything eaten is to be thoroughly masticated, and the patient must be made to spend the proper amount of time with his food and to avoid any semblance of rush or hurry. Orange juice, if given at all, is to be allowed only with

or after the morning meal; never before. At the beginning of treatment it would be well to discontinue it entirely and to substitute prune juice. The albuminous part of the egg only is to be eaten, as the yolk tends to strongly excite acid secretion. Highly seasoned soups should be interdicted and red meat served only once a week. All excessive sugar, also candy, sodas, ice-cream, and pastry, are to be avoided. Tea, coffee, and ice-water are harmful. Raw fruit is not permitted until the appetite has become perfectly normal. A diet of farinaceous foods with milk, potatoes, green vegetables, meats (except red meat), stewed fruit, and wheat bread, toast or zweiback, is to be followed. The milk should be limited to one pint a day, with the water taken mainly between meals.

Due attention must be paid to the proper hygienic measures in the treatment of these patients. The right amount of rest is to be insisted upon, especially when the child has been under some mental or physical stress. An entire change of scene is advisable, if possible, for the worst cases, these doing well at either mountains or seashore. For the others, late rising, an afternoon rest period, and a cold sponge bath followed by a brisk rub at night, after a day of healthful out-of-door physical exercise, are valuable aids in the treatment.

CHRONIC PURULENT INFLAMMATION OF THE MIDDLE EAR AND ITS ACCESSORY CAVITIES AS SEEN BY THE GENERAL PRACTITIONER.

In the *Journal of the Medical Society of New Jersey* for May, 1920, KEELER states that the best precautionary means to prevent a chronic purulent inflammation of the middle ear is the proper treatment during its acute stage. This is best attained by an early recognition and an immediate free incision of the ear-drum. Delay is dangerous. Do not wait for spontaneous rupture, as too frequently the delicate structures of the middle ear and the mastoid are irreparably damaged before the rupture takes place; the rupture being sometimes delayed because of its unusual resistance, and in that case the edges of the perforation are irregular lacerations which soon become necrotic.

If the discharge persists beyond six or eight weeks, or if the mastoid shows evidence of serious involvement, a posterior drainage through the mastoid should at once be instituted. In every case it is important to determine whether the necrosis is in the tympanum, the Eustachian tube, the attic, the antrum, or the mastoid. There are many methods of examination; but he knows of no surer test of the active disintegration of the osseous structures than that of the roentgenogram.

Treatment of chronic purulent otitis media consists chiefly of two methods:

(1) Direct medication of tympanum.

(2) The approach through the mastoid.

The character of the treatment, of course, depends upon the complication. Generally speaking, however, the middle ear is treated by the so-called wet or dry method. The wet method consists of a warm non-irritant germicidal solution used as irrigation, once or twice a day according to the amount and the character of the discharge. This is usually done by the patient, or by some member of the family.

The second, or dry method, is best obtained by cleansing the auditory canal and the tympanum; mild astringent preparations being introduced into the tympanum by the physician.

The case complicated by insufficient drainage due to too small an opening in the tympanic membrane, or to cholesteatoma, polypi, exostosis or to hyperostosis, should have the treatment directed according to the existing condition.

Autogenous and stock vaccines have been used by doctors with a varying degree of success. These may have their usefulness. Personally, he has not had the good results that others claim. He strongly urges an otoneurological examination by which the condition of the static and the acoustic layrinth and the intracranial complications may best be determined.

When all other methods have failed, a

thorough removal of all the diseased tissue, both membranous and osseous, by a mastoid operation is the only safeguard against intracranial dangers.

VALUE OF LUETIN IN AN OUTPATIENT DEPARTMENT.

MEYERS, in the *Archives of Pediatrics* for April, 1920, concludes:

1. The luetin test is more reliable in congenital lues than the Wassermann.

2. At least 65 per cent of congenital luetics will react positively to the test.

3. It causes no constitutional reaction.

4. It is more important to do a routine luetin test in the clinic than the von Pirquet test, providing the material can be obtained.

THE USE OF GAS INJECTIONS FOR X-RAY EXAMINATION OF ORGANS IN THE PERITONEAL CAVITY.

In an editorial on this subject the *American Journal of Electrotherapeutics and Radiology* for May, 1920, states that the advent of a method of roentgenological examination of the abdomen by the use of gas injection within the peritoneal cavity has aroused much interest, because of the possibility of the further development of the diagnosis of obscure lesions of the abdominal viscera.

Like every new method it is received with wildly enthusiastic acclaim, particularly by those who do not fully appreciate the advances which have already been made in the Roentgen diagnosis of abdominal diseases. While it cannot be doubted that the method has its values, it must also be understood that it distinctly has its limitations. It would appear from some of the comments and some of the quoted reports that by this procedure it is possible to outline the organs of the abdominal cavity, as a feat which is absolutely new and which cannot be accomplished without this method. This is decidedly erroneous. For instance, the delineation of the kidneys is a matter of every-day routine. And so with the spleen, its entire extent may be clearly outlined by the ordinary roentgenological methods. So the lower border of the liver may be readily determined.

The new gas injection method, therefore, has no great practical utility in the determination of these organs, but if it is considered essential that the organs be so sharply delineated that their contours may be so apparent that "he who runs may read," that, of course, is another matter.

On the other hand, this method has its great value in the determination of such abdominal tumors as cannot be outlined by the usual roentgenographic methods—for instance, those springing from the aorta, adrenal, the uterus and adnexa. It is to be regretted that the pancreas, an organ which cannot be delineated radiographically by the ordinary methods, has not yet been demonstrated by this newer method.

There is a serious doubt whether, with the exception of the lesions of the pelvic viscera, the lesions demonstrated by Stein and Stewarf in their original article could not have been diagnosed by the usual roentgenographic means.

The method is harmless, particularly when carbon dioxide gas is used. In fact, Bastanelli has stated that it is the usual routine in his office procedure to inject patients with a small amount of gas and then to send them home, after fluoroscopic examination.

This method is never destined to become a routine, and will be a valuable supplement to but will not replace the bismuth examination.

THE DRUGLESS THERAPY OF DIABETES.

In the *New York Medical Journal* of May 8, 1920, STARK asserts that in prescribing a diet we must bear in mind that there are clear limitations to dietotherapy beyond which it is not safe to venture. Among such the following stand out prominently:

First, the danger involved in a continuous one-sided diet.

Second, the natural requirements and

cravings of the economy for all food elements, not excepting water, salts, and vitamines.

Third, the dangers of a strictly starch-free diet, continued over long periods.

Fourth, the menace involved in strictly scientific feeding based upon ingenious theories.

Dangers of a One-sided Diet.—He refers to the frequency with which an acidosis is incited by a long period of starch-free dieting, or to the intestinal toxemias which manifest themselves after a continuous overindulgence in proteins. Many diabetics present symptoms referable to overindulgence in animal foods rather than to a failure to burn up sugar. He has observed that a diabetic patient who assimilates meat poorly is worse off than one who assimilates starch poorly. His vicarious metabolism shows that a number of his organs are physiologically crippled. Such patients will run low sugar percentages, show marked symptoms of prostration, muscular weakness, especially in the calves, and intestinal derangements. Therapeutically, here the indication is to secure functional rest for their protein digestive organs and to allow a limited proportion of starches. The error of overindulgence in fats must not be overlooked, as there is a likelihood of acidosis; such overindulgence manifests itself in acetonuria, emaciation, and fatty stools.

In health there should be a normal craving for all food elements. There may be individual predilection varying between total abstinence from one food element, as seen in vegetarians and fruitarians, to the insatiable appetite for sweets or carnivorous longing for animal food in others. Of course the ideal of a healthy metabolism is a so-called balanced ration, which has a due regard for the necessity of all food elements. The influence of age upon a choice of food must be considered. Infancy, manhood, middle age and old age each have their own level of food necessity. Dietary measures in aged diabetics should never be rigid, otherwise the treatment inflicts more harm than the disease does. Alcoholic stimulation in aged diabetics is beneficial. In these cases cognac, brandy, or whisky has a distinct food value and materially enhances the digestion of fats. Persons engaged in sedentary occupations have food requirements quite distinct from those employed at hard labor.

The Dangers of a Strictly Starch-free Diet.—We are on the wrong track if we allow ourselves to believe that a glycemia is the greatest source of danger, or that the gravity of a given case of diabetes can be measured in terms of sugar excretion. Many diabetics with high sugar percentages remain in better condition than do those with lower sugar percentages. It was formerly the custom to govern the intake of sugars by the degree of glycosuria and to estimate the severity of the disease by the amount of sugar excreted, but to-day we know this is a delusive guide. Individual tolerance for sugar is a variable quantity. It fluctuates within wide ranges in the same person; then again some persons exhibit a different tolerance for different carbohydrates. Some individuals can burn up, so to speak, potatoes better than other carbohydrates; others again can burn up oatmeal by preference.

The danger of acidosis in a prolonged starch-free diet must be borne in mind. A pertinent question may arise here, namely, How long may a diabetic safely continue on a starch-free diet? The answer is about four weeks. This answer suggests another question: How much carbohydrate food may be allowed a diabetic? the answer being as much as he can assimilate. It may be two pints of milk or its carbohydrate equivalent, daily, or two potatoes or three slices of wheat bread.

The theory involved is strictly scientific feeding. He refers first to the universal custom of employing the calorie as a measure of food value. On more than one occasion he has endeavored to prove that the calorie cannot be employed as an index of nutrition or as a basis for computing the food requirements. He has also taken the stand that feeding based upon chemical and mathematical formulæ has too often proved to be a therapeutic fallacy. Something less

arbitrary than weights and measures are needed to determine heat equivalents. Nature and the laboratory are often at odds where the human economy is concerned. As he has stated in a previous publication, caloric feeding might have a place where the feeding of masses was concerned, as an army or in hospitals and prisons, but in an individual whose health balances are out of gear, caloric feeding leaves much to be desired.

Unless treatment is to become merely perfunctory a close clinical study of the patient's mental and physical condition must be made, his powers of assimilation for various foods must be gauged, and an exhaustive search for any source of infection should be a routine procedure. Fortified with such a survey of the patient, each case must be treated on its own merits.

In diabetes complicated by nephritis it is essential that the tolerance for carbohydrates should be established, for there may come a time, depending upon the cardiac or renal function, when proteids must be discarded in favor of starches. When such patients show signs of cardiac decompensation, edema, or cerebral symptoms, food rich in proteins should be discarded, substituting milk and cereals. A method he frequently adopts, if edema is marked, whether cardiac or nephritic, is to place the patient upon the so-called Karrell diet for some days. It is his custom to insist on a low diet for twenty-four hours once in three weeks; on this day the patient is instructed to rest up at home; he is placed on a rigid starch-free diet, a saline laxative starting the day. He prepares a menu for each meal, totaling for the day between 800 and 1000 calories divided between fats and proteins, say in the proportion one to three.

When a patient first presents himself and there are no urinary contraindications, Stark begins the treatment by a rigid starch-free diet for about ten days, at the expiration of which, if the patient is aglycosuric, he gradually restores carbohydrates to the limit. A knowledge of the starch content of various articles of food is here essential for the intelligent control of the patient. In the very severe types of the disease, those that excrete glucose even from protein intake, our chief aim should be to avert acidosis and to ward off infections. When we consider how differently individuals react to carbohydrates, fats, and proteins, it would seem that the disease which now is labeled diabetes is merely one phenomenon of a complex pathological entity yet to be identified.

The drugless therapy of diabetic coma should be considered under two divisions: First, that of the precomatose stage, and secondly, that of the comatose stage. The prophylaxis of diabetes calls for frequent urinalyses, for when ketonuria increases the diet should be relaxed. An exclusive diet of proteins and fats must be prescribed, while carbohydrates in the form of potatoes, wheat bread, and milk and alcoholic beverages in limited quantities, should be allowed.

THE TECHNIQUE OF LUMBAR PUNCTURE.

In the *Boston Medical and Surgical Journal* of May 6, 1920, Lowrey states that the site of election for lumbar puncture is between the third and fourth lumbar vertebræ, because this space is usually the widest. With the back in the right position, however, lumbar puncture may, with entire safety, be performed in the second and fourth spaces and rarely in the first space. In children, one needs to remember that the spinal cord extends to a lower point in the vertebral canal than it does in the adult. In the adult the lower end of the cord is usually about at the first lumbar intervertebral disk. Accordingly, punctures below this point may be done without danger of injuring the cord. The third lumbar space is, as a rule, about on the level with the crest of the ilium. This constitutes a useful guide in fat people, when palpation of the spinous processes may be uncertain.

One must be careful to find the middle line, and be careful to allow for spinal curvature, if such exists. The point of election for puncture varies. He prefers

to go in the middle line, going through the thinnest portion of the supraspinous ligaments, and so straight in, whereas others prefer to take a point about five millimeters to the right of the middle line, thereby avoiding the supraspinous ligaments altogether. However, he finds that he is able to direct the needle more accurately if he takes the middle line than if he goes to one side. At times, however, as where there are many exostoses of the spinous processes, it may be necessary to go to one side in order to avoid the bone.

With the index and middle fingers of the left hand the operator locates the point at which he wishes to do puncture. With the elbow raised these two fingers are applied to the middle line from the left side of the patient. Having found with the middle finger the spinous process below which we wish to insert the needle, and having ascertained the general characteristics of the space with the index finger, the index finger is then pulled downward on to the spinous process of the next vertebra, thus rendering the skin tight and leaving a space between the two fingers corresponding to the intervertebral space, into which the needle is thrust.

Most of the difficulties in puncture, which are not to be explained by lack of coöperation, are due to the failure of the operator properly to direct his puncture. Having located the space with the thumb, he takes the thumb away and jabs at the space with the needle, or perhaps he marks it in some way and then jabs. The difficulty here is that the relations are not precisely kept in mind at all times, as they may very easily be if the fingers are kept in position in the manner described above.

In quiet, coöperative patients, in whom the landmarks are at all palpable, the above method will obviate the necessity for punching and poking around and causing the patient great pain by bringing the needle in contact with the periosteum. If one is careful to keep the midline, to direct the needle at right angles to the longitudinal axis of the column, to select carefully his space and then go through it with equal care, results are very good indeed. Rarely, however, bone will be encountered in an unexpected place. In such cases, by withdrawing the needle slightly and altering its direction, always in the axis of the column, we are usually able to get into the canal without further difficulty.

Having found the proper place, the needle should be quickly passed through the skin, and then further progress may be more slowly made. If the needle is slowly pushed through the skin, the pain is considerably increased and the tendency to arch the back forward is also increased. This is one great advantage of a sharp needle.

The pain of lumbar puncture comes: (1) when the skin is pierced; (2) if the periosteum is touched; (3) referred pains occur when bundles of nerves are struck. In the normal case no referred pains will be complained of, since the nerves being movable slide out of the way of the needle. But in cases with meningitis, when the nerves are matted together and so do not evade the needle, pains may be referred to the leg; and rarely we may get involuntary kicking, due to irritation of motor roots.

One can usually tell when the needle is entering the spinal canal. There is a slight increase in resistance to the passage of the needle when the dura is reached, and this suddenly gives way to non-resistance, often with a slight sound which is perceptible. This very characteristic feeling of loss of resistance indicates the proper time to stop inserting the needle.

Care must be taken that the needle goes in straight and not to one side. Occasionally this occurs, and the point of the needle is inserted into the dural space at its lateral margin. In such cases very little fluid will be obtained. By partially withdrawing the needle and redirecting it straight, fluid may be gotten.

Care must be taken not to overrun and go into the bone or intervertebral disk at the front of the canal. This is painful and often gives slight hemorrhage into the fluid.

In many cases the fluid does not run very rapidly, and he has found that by twisting

the needle, without varying its depth of introduction, the fluid will nearly always run out at a sufficiently rapid rate. Just why this should be so is not entirely clear.

One should not withdraw more than 10 Cc. of fluid, except in cases which are to be treated. It is safer to withdraw smaller than larger amounts, because of possible after-effects. When a sufficient quantity of fluid is obtained the needle should be quickly withdrawn.

The iodine is then washed off the back with alcohol, flexible collodion applied to the point or points of puncture, and the patient is put to bed for twenty-four hours. During this time he should lie flat on his back, without a pillow, and it is somewhat advantageous if the foot of the bed be raised. He should have only a liquid diet during this time.

After-symptoms of puncture do not, as a rule, occur in those with a meningitis. It is very rare indeed for a paretic or other case of neurosyphilis to suffer any discomfort after lumbar puncture. Cases with normal meninges, however, often have headache and sometimes nausea and vomiting, particularly if they have not kept quietly in bed or if an excessive amount of fluid has been withdrawn. In case headache and nausea are complained of, he finds that potassium bromide, in 20-grain doses, given once, or twice if necessary, will often suffice to correct the headache and nausea. At times a mild grade of headache may persist for several days. Very rarely the discomfort is so acute that it is necessary to give a hypodermic.

RHEUMATIC FEVER.

WHITE, in the *American Journal of the Medical Sciences* for May, 1920, states that the most striking lesson learned from the series of cases of acute rheumatic fever at U. S. Base Hospital No. 6 was the remarkable response to forced salicylate therapy. Almost invariably there was an abrupt ending of joint pain, swelling, fever, and malaise. At one time there were two wards full of cases of rheumatic fever. The salicylates were given in large doses to the patients in one ward. That was their only therapy, except for good nursing care. These patients did wonderfully well. The patients in the other ward were given no salicylates internally at first, but received oil of gaultheria and camphorated oil applications to their joints and phenacetine and veronal by mouth. Their pain and discomfort was dulled to a slight degree, but after two or three days of suffering the salicylates were given to them also in large doses, with striking and rapid relief. Aspirin and sodium salicylate were used, almost always aspirin.

The routine procedure in the acute cases was the administration by mouth of 30 grains of aspirin every four hours until the symptoms were relieved; usually 200 to 300 grains were necessary in the course of two or three days to bring complete relief. After that the drug was continued in small doses, 10 grains two or three times daily, for example, for a week or as long as seemed necessary. Toxic symptoms were astonishingly rare. No alkali was given, the aspirin being tolerated easily by the gastrointestinal tract. Only three or four cases of the entire group failed to be checked by the salicylate and continued in their illness for a fortnight or more. Patients as a rule had been sick two or three weeks before admission to the hospital. They remained in the hospital usually about three weeks before being discharged to duty. A few with cardiac complications were returned to the United States.

In his summary White makes the following statement:

1. In a series of 73 soldiers with acute rheumatic fever, 51 per cent gave a previous history of rheumatic fever and 40 per cent showed large or ragged tonsils.

2. The joints involved in order of frequency were knee, ankle, shoulder, wrist, foot, elbow, hand, and hip.

3. Acute pericarditis was found in 10 per cent of the cases, usually very transient. Acute pleuritis was found in 19 per cent.

4. There was evidence of mitral endocarditis in 40 per cent of the cases; mitral

and aortic endocarditis combined in 8 per cent. Most of these cases were apparently of long standing. Acute temporary heart-block was discovered in 4 per cent of the cases.

5. Three cases made striking recoveries after a very serious prognosis had been given. In two of the three streptococcus septicemia was found by blood culture; both of these soldiers returned to full active duty two months later. The third case, although suffering from serious permanent heart trouble, survived a long rheumatic infection complicated by frequent embolism and by a severe anemia, the red corpuscle count falling as low as 2,400,000 per c.mm.

6. Response to forced salicylate therapy was very striking. It seemed that the course of the disease was shortened by salicylates.

It is probable that salicylate therapy when forced in rheumatic fever acts as prophylaxis against cardiac involvement by shortening the disease.

FLUID INJECTIONS IN DEHYDRATED INFANTS.

McLEAN and LANG, in the *American Journal of Diseases of Children* for May, 1920, in their summary state that injection of fluid into the peritoneal cavity in dehydrated infants is a simple method of procedure, and in their hands has had no undesirable effects.

The size of the infant is no bar to his ability to utilize injected fluids.

From the results of injections in very small infants, weighing less than 3000 gm., they are led to believe that larger infants might utilize larger amounts than have been given to infants in their study.

Age has no bearing on the infant's ability to utilize injected fluids.

The pulse is more frequently affected after sinus and intraperitoneal injections than after hypodermoclyses.

The respiratory rate is more frequently affected in peritoneal injections than in sinus injections and hypodermoclyses.

The temperature is more frequently elevated in sinus injections than in intraperitoneal injections or hypodermoclyses.

Weight gains are more frequently noted following intraperitoneal injections than after sinus injections or clyses.

Certain infants do not show any improvement until they have had repeated injections of fluid.

The shorter the interval between the onset of symptoms and the beginning of treatment the greater is the response.

NEURITIS: ITS PATHOLOGY, SYMPTOMATOLOGY, AND TREATMENT.

ROBINSON, in the *Journal of the Missouri State Medical Association* for May, 1920, states that alkalies, such as bicarbonate of soda in large doses with abundance of water, are usually beneficial in all forms of neuritis. Atophan and pyramidon are helpful in controlling the pain. Quinine should be used in malarial neuritis, iodides of mercury in syphilitic, iodides and sulphates in lead neuritis, and salicylates in rheumatic neuritis. After the acute stage is passed, strychnine is usually helpful, also iron in the form of Blaud's mass and other tonics.

Operative Treatment.—Sciatic neuritis may usually be quickly cured by injecting into the nerve sheath at the sacrosciatic notch 100 Cc. of normal hot saline solution. Causalgia yields to the intraneural injection of 50-per-cent alcohol. Tic-douloureux is promptly relieved by an injection of 80-per-cent alcohol into the sheath of the affected nerve. Many forms of brachial neuritis are relieved by the daily injection in the suprascapular region of a 3-grain ampoule of sodium cacodylate. If there be tender spots over the scapula from which the pain radiates down the arm on pressure, the injection of a few drops of a 4-per-cent solution of procaine followed by a few drops of 80-per-cent alcohol down to the bone at the point of greatest tenderness will in some cases promptly and effectively relieve the pain.

Electricity should not be used in the acute stage of neuritis; after the passage of the acute stage the d'Arsonval or high-

frequency currents relieve pain as does a mildly galvanic current if the electrodes have been wet in a saturated solution of sodium salicylate and applied along the nerve trunk. The interrupted galvanic and faradic currents if applied to the paralyzed muscles aid in the prevention of atrophy and in the restoration of the muscles.

During the acute stage the patient or the affected portion of the body should be kept at rest. In brachial neuritis it is best that the arm be kept in a sling. In all forms of polyneuritis the patient should be confined to bed until after the acute stage is passed. This is also advisable in acute mononeuritis of the lower extremities. Heat, either moist or dry, relieves pain and reduces the inflammation. Radiant electric heat is especially beneficial. Massage should not be used until after the subsidence of the acute process. Deformities of the limbs should be prevented as they are chiefly responsible for the permanent disabilities after neuritis.

In many cases of neuritis even of the multiple type, the extensor muscles are weakened to a greater degree than are the flexors. If there be a difference in degree of paralysis of opposing groups of muscles, there is a tendency on the one hand toward hypershortening of the less paralyzed group and hyperstretching of the opposing group. This overaction must be prevented for the following reasons: (1) It prevents complete rest of the anterior horn cells; (2) the overstretching of the affected muscles interferes with their recovery. The limb must therefore be put in such position as will bring about relaxation of the paralyzed muscles, but as William McKenzie points out, relaxation is only the beginning of treatment; more than this is required, and that is reëducation of the paralyzed muscles. A paralyzed muscle that is constantly stretched is at a disadvantage and will not recover its power and tone. Posture is therefore the great factor in securing physiological rest of the muscle, and it is important to consider what is the zero position of any given muscle. McKenzie defines the zero position as the position of anatomical rest in which the individual muscle itself is relaxed and both its own actions and that of its opponents prevented. Sherrington has shown that the distribution of tonus is arranged on a plan of strict coördination, and that reflex tonus embraces those movements which counteract the effect of gravity, and that postural contraction can be maintained for long periods without fatigue. A position which can be maintained without fatigue must be the position of rest.

Rest, posture and reëducation are then the important methods of treating muscles which have been paralyzed by neuritis. Numerous methods have been adopted for keeping the paralyzed muscles at rest and in a state of relaxation. Some consider rest in bed as sufficient, others place the limbs between sandbags, others place boards at the bottom of the bed to keep the foot in a dorsiflexed position. Various splints of metal and other material have been used. Some have used plaster-of-Paris molds. The celluloid splints as used in the treatment of paralysis of poliomyelitis are usually very satisfactory in meeting the two principal conditions, namely, putting the paralyzed muscles in the most favorable position for their speedy recovery and the prevention of deformity due to muscular shortening.

THE ANTINEURITIC AND GROWTH-STIMULATING PROPERTIES OF ORANGE JUICE.

Byfield, Daniels, and Loughlin, in the *American Journal of Diseases of Children* for May, 1920, state that the results obtained by the addition of orange juice to, or omission from, the diet of babies were uniform and constant. Under the conditions maintained, growth, as evidenced by the weight curves, was in all cases stimulated when orange juice was given. On the other hand, orange juice from which the antineuritic vitamine had been removed was without influence. The fact that the changes produced were usually apparent within a day made the results more significant. That other constituents of the orange

juice, for example, the carbohydrates, apparently played no part in their results is shown in one case. Dietary increases, both during and after an orange-juice period, were without marked effect. Furthermore, the addition of 3 gm. of sugar—dextrimaltose—an amount equivalent to the sugar content of the orange juice of the previous period, was also without appreciable effect. In certain instances the gains were less marked than in others, the greatest gains being made in those babies receiving the most food based on their theoretical weight. If the caloric intake per kilogramme—that is, kilogramme of estimated weight—fell to ninety or therabout, there was less stimulation.

Up to the present time studies dealing with the influence of the antineuritic vitamine on growth have not shown whether the weight increases were due to the stimulation of appetite, and thus an increased ingestion of food, or to the direct influence of the antineuritic vitamine on metabolism. While not attempting to solve this problem, they have watched their children with this point in mind. In no case was a loss of appetite apparent, the same amount of food being taken during the entire experimental period. In animal experiments the conditions are quite different; for in these considerably less than the minimal requirement of the antineuritic vitamine is usually given for a much longer time. Under those conditions the appetite is greatly diminished; when the antineuritic vitamine, therefore, is added, the effect on the appetite is marked. In their babies' diet, however, a considerable amount of this essential growth constituent was always present, and therefore the appetite factor did not seem to enter into consideration. Furthermore, they recall the paralyzing influence of the polished rice diet on the gastrointestinal tract of the polyneuritic pigeons and wonder if it is not this phenomenon which in animal experiments, in part at least, is responsible for the anorexia. In general, it appears that the appetite factor plays only a minor rôle in the stimulating effect of the water soluble vitamine growth, provided a nearly adequate amount is being given.

The question as to whether the antiscorbutic vitamine has growth-stimulating properties has not been the subject of extensive experimentation. All authors agree that there is a loss of weight in experimental scurvy, especially as the manifestations become more distinct. There is, however, a corresponding loss of appetite which may be responsible for this. To be sure, in the many observations made by Hess, a failure to gain in children was usual; and in the early stages of the disease, at least, there was no actual loss in weight. Harden and Zilva and Drummon have reported that rats fed a purified ration to which a small amount of orange juice was added as an antiscorbutic made better gains than others similarly fed but without the orange juice. They concluded from their work that the antiscorbutic vitamine was essential to the well-being of animals, as manifested by the better weight gains of the rats receiving it. This suggests that the antiscorbutic vitamine has growth-stimulating properties. Their own observations on babies, however, fail to bear this out.

At the present time there is little information regarding the coexistence and quantitative relationship in foods of the two water-soluble vitamines—the antineuritic and the antiscorbutic. Orange juice has been demonstrated to contain both in appreciable amounts. Similarly, Hess had found that both are present in the tomato. Other foods which have been found to contain both in demonstrable quantities are banana, cabbage, potato, and turnip. It is very probable that this list will be greatly extended by further work.

The pathologic similarities of beriberi and scurvy have been pointed out by a number of workers. Funk, however, believes that foods which are specific for scurvy also protected against beriberi, although the "beriberi vitamine" is a prophylactic against beriberi only. At that time he did not appreciate that both vitamines might be present in one and the same

food. That certain foods, for example milk, contain both vitamines may also explain the fact that some of the symptoms of both diseases are sometimes present in one and the same individual, the disease type depending on the greater deficiency of the particular food accessory. Thus, similar heart signs and symptoms are described in both scurvy and beriberi. It is possible that the heart symptoms present in those babies who were suffering from scurvy were due, in part, to a lack of the antineuritic vitamine.

THE TREATMENT OF TUBERCULOUS CERVICAL ADENITIS.

The *Journal of Laboratory and Clinical Medicine* for April, 1920, in an editorial calls attention to a paper on this subject by Abbott in which he holds that in the treatment of this condition the first attempt should be to prevent further infection. This can be accomplished, in part at least, by attention to the mouth and throat. Any decayed teeth should be attended to by the dentist. The tooth-brush and other methods of cleaning the oral cavity should be resorted to. Hypertrophied tonsils and adenoids should be removed, and any discharges from the nose or ear should be properly treated. The patient, although it is too late to prevent primary infection, should sleep out-of-doors, and have an abundance of properly balanced food. The time-honored syrup of iodide of iron should be tried. In some instances potassium iodide may be of benefit, and according to the author never induces any untoward effect. [With this we disagree.—Ed.]

Abbott gives first place in the treatment of these glands to tuberculin. He says that he has frequently been consulted by patients seeking to avoid operation, who have patiently plodded the long road of palliative treatment, who have become discouraged and were about to turn to the scalpel as their only hope—he has seen these restored to a perfectly normal condition by the intelligent use of tuberculin. He thinks that tuberculin acts by increasing the formation of fibrous tissue, and that this hyperplasia is associated with the protective deposits of mineral salts. In this way progression toward suppuration is arrested, and eventually contraction of the fibrous tissues causes a general regression in the size of the glands.

When other measures fail surgical operation should be resorted to. Abbott adds that one should not wait until the glands have broken down, ruptured their capsules and matted together, because by that time the deeper lymphatics will have become involved and the boundaries of the triangle will have been passed. The writer of the editorial believes that trusting to medicinal treatment, whether it be iodide or tuberculin, is in fact delaying too long and that surgical operation should be performed immediately when involvement is confined to the superficial glands.

Abbott is quite sure that, in many instances at least, a cure can be secured by the surgical removal of the infected glands, but that this is possible only when the invasion is limited to the triangular area. Moreover, the removal of the infected glands, if done soon enough, will prevent penetration to the deeper lymphatics and possibly the later development of pulmonary tuberculosis. The best results are obtained in children under ten years of age.

EXPERIMENTAL STUDIES ON DIABETES.

Allen, in the *Journal of Experimental Medicine* of May 1, 1920, in concluding an article on this subject states that:

1. Practically every detail of clinical diabetes can be reproduced in partially depancreatized animals. The resemblance is made still more exact by the susceptibility of such dogs to acidosis and coma, as will be shown in later papers, and also by the similarity of the anatomical changes in the islands of Langerhans. These animals are, therefore, useful test objects for a therapeutic investigation.

2. These animals at first show considerable tendency to regain assimilation, com-

parable to that in the early stage of most human cases of diabetes; and in some instances they recover so as to be able to endure any degree of duration of carbohydrate feeding, and can be made diabetic only by removal of additional pancreatic tissue. Similar recovery in some human cases, especially after acute pancreatitis, is a probability. This recuperative tendency can be negatived by overfeeding, even without glycosuria. With duration of the diabetes the power of recuperation diminishes and practically disappears in dogs as in human patients.

3. In the absence of progressive pancreatitis or other extraneous causes, these dogs show no inherent downward tendency in their assimilation. This conclusion rests upon observations as long as six years from the first pancreas operation and three years of known diabetes. This absence of inherent progressiveness is what should naturally be expected in animals with simple resection of part of an organ, and serves further to fit them for accurate feeding experiments.

4. Every detail of the downward progress of human patients on various diets is reproduced in such animals. They lose assimilation and die most rapidly on diets rich in carbohydrate, and less rapidly on excess of other foods. The differences between sugar and starch, and between starch and protein, seem to be only those of degree and time rather than anything absolute. The important point is that, granting the absence of spontaneous downward tendencies as stated, all the different kinds and degrees of downward progress in the records of animals in this and a preceding paper are purely the results of overstrain of the internal pancreatic function by excess of food.

5. Varying degrees of success and failure in the dietetic control of diabetes are also illustrated. The benefit of the classical treatment by exclusion of preformed carbohydrate and limitation of protein is confirmed, in the prolongation of life and well-being to some extent in nearly all cases, and perhaps indefinitely in some of the mildest cases. In the great majority of cases such a therapeutic result is not permanent, and downward progress is finally observed if the observations are continued long enough. In most of these cases life, strength, and assimilation can be preserved for a much longer time by a degree of undernutrition suited to the severity of the diabetes, and accomplished by limitation of fat in the diet. The permanence of such control is supported by the unimpaired or rising assimilation in experiments of twelve to twenty-one months' duration, but still longer observations would be desirable. Diabetes of great severity is controllable only by correspondingly radical undernutrition. In still more severe cases glycosuria can be abolished only by a degree of undernutrition which entails final death from inanition. In the most severe cases glycosuria cannot be stopped, evidently because the assimilative power is too low to dispose of even the minimum supply of food materials, namely, that derived from the body stores in fasting.

6. A claim of saving every patient, no matter how near death, would be a preposterous one for any remedy in any disease, and the animal experiments do not support such a claim for diabetes. Also it is unreasonable to expect the actual cure of an organic deficiency by diet, and the diet treatment in animals, just as in patients, generally represents the sparing rather than the restoration of the weakened function. The basis of the belief in the inherently progressive tendency of severe cases of clinical diabetes is shaken by the exact reproduction of such case histories by diet in animals which are free from spontaneous downward tendencies; but there is still lack of a sufficient number of patients treated on the principle of relief of the total metabolic burden to demonstrate the absence of such inherent progressiveness in human diabetes. As described elsewhere, the principle mentioned has given encouraging results in proportion as it has received actual application in practice. The clinical problem requires the same prolonged careful control of all discoverable

symptoms as in animals, and cases too severe for such control, or complicated with infections, violations of diet, etc., are on the same plane as animals in which a similar condition has been produced. Some proportion of cases, especially in young persons, will be found suitable for accurate determination of the question of whether all or most cases of severe diabetes are inevitably progressive and hopeless, and the writer looks forward to publishing such a series. Irrespective of the outcome, the raising of this question is justified by its importance. On the theoretical side, it involves both the general prognosis and the nature of the process underlying diabetes. On the practical side, it is already established that diet is at least the chief cause of downward progress, and it is important to eliminate this cause by avoiding the dietary injuries illustrated in animal experiments.

REACTIONS TO SUBCUTANEOUS INJECTIONS OF ADRENALIN.

SANDIFORD, in the *American Journal of Physiology* for April, 1920, states that her experiments indicate that the injection of adrenalin chloride produces invariably an increase in the rate of cellular combustion varying between a calorific increase of from 4 to 48 per cent. This increase is accompanied as a rule by an increase in the ventilation rate, respiration rate, number of heart-beats for each minute, volume of each beat, greater utilization of the blood-carrying power, and peripheral dilatation with an increased systolic and decreased diastolic blood-pressure. Not all these compensatory factors necessarily come into play in each instance; as would be expected, various combinations may occur, sometimes one factor, sometimes another factor acting as the major compensation. In individual instances it is impossible to predict the combination, although in perfectly healthy and well-trained persons such as those in the group of normal soldiers studied by Tompkins, Sturgis, and Wearn, each compensation factor plays its rôle so well and so easily that there is discernible only the slightest increase of any one factor, while in the case of ill-acting hearts (irritable hearts) the response to extra demands is not smoothly and efficiently accomplished. This is true also in any condition like hyperthyroidism, in which the circulatory system is more or less damaged and already severely taxed by its own increased metabolism, and as a result an additional load is not readily borne.

No relationship was found in his experiments between the intensity of the reaction and the degree of hyper- or hypothyroidism. There is no sound physiologic foundation, so far as Sandiford can see, for the assumption that the character of the reaction following the injection of adrenalin chloride is indicative of the activity of the thyroid gland.

The cause of the increased heat production is unknown. The similarity of the metabolic rate curve following the injection of adrenalin to that found by Lusk from a carbohydrate plethora naturally directs attention to the possibility that the increased heat production is due to an excess of carbohydrate metabolites. In addition there may be, however, a direct chemical stimulation of cellular combustion. In either case the phenomenon is obviously in harmony with Cannon's "emergency theory" of the action of adrenalin.

Sandiford summarizes her article as follows:

1. Forty-six experiments are reported on the effect of the subcutaneous injection of adrenalin chloride on the metabolic rate, pulse rate, and blood-pressure of patients suffering from various disorders of the ductless glands.

2. A supplementary series of 27 experiments is added in which a study was made of the effect of the adrenalin injection on the pulse rate and blood-pressure (the basal metabolic rate being known).

3. Adrenalin chloride (0.5 Cc. of 1:1000) injected subcutaneously invariably causes an increase in the metabolic rate. This increase is usually accompanied by an increase in the ventilation rate, respiration rate, number of heart-beats each minute,

volume of each beat, greater utilization of the blood-carrying power, and peripheral dilatation with an increased systolic and decreased diastolic blood-pressure.

4. No relationship was found between the intensity of the adrenalin reaction and the degree of hyperthyroidism or hypothyroidism.

5. Attention is directed to the similarity of the metabolic rate curve following the injection of adrenalin to that found by Lusk from a carbohydrate plethora, and to the possibility that the increased heat production is due to an excess of carbohydrate metabolites. It is suggested that in addition there may be a direct stimulation of cellular combustion.

THE ROENTGEN RAYS IN THE TREATMENT OF MENSTRUAL DISORDERS.

HUNTER, in the *Virginia Medical Monthly* for April, 1920, states that in order to obtain a ray satisfactory for treatment, only the modern transformer and Coolidge tube may be considered. He uses a tube backing up a spark of as nearly nine inches as possible, which, conservatively estimated in the great majority of machines, will actually run from eight and one-half to eight and three-quarter inches. A spark greater than this is likely to injure the tube. Such a ray, filtered as he describes, can be safely applied in doses of a double erythema. Formerly it was applied for five minutes over each square, but lately he has found it better to lengthen somewhat the time of exposure, so that it is now used from five to seven minutes. To be efficient, the rays must be applied as near the skin as possible, so that a distance from target to skin of from seven to eight inches is that usually preferred.

The technique described is that known as the intensive method. It has the advantage that it is constant in amount, easily administered, and brings about the desired result in the quickest time. It may, of course, not all be given at the same time, only a few areas being treated on the same day. But as the great majority of patients are made more or less ill by the procedure, it is best not to prolong the treatment over too great an interval. When convenient, it is probably best to extend the abdominal treatment over two days. Yet the great majority of his patients have received the whole abdominal treatment at one sitting. Two weeks later he irradiates the back. He then waits two more weeks, and, if necessary, he again irradiates the abdomen; and again the back as before. It has been found that intervals of three weeks between treatments are generally safe, if no erythema has developed, but as an additional mark of safety he feels that the suggested procedure is the best. This, combined with the use of Dodd's lotion and the prohibition of hot water or other irritants, furnishes all that we now consider best. Of course, accidents will happen and idiosyncrasies develop, but for this the roentgenologist and gynecologist cannot be held responsible.

It will be readily seen that the treatment suggested above for menstrual disorders is essentially that employed in the treatment of uterine fibromyomata, save that it is not continued over so long a period and that fewer squares are irradiated. Theoretically, it is open to the same objection, namely, that in causing a degeneration of the endometrium or smooth muscle fibers we are laying the foundation for future carcinomata. He has yet to hear of an authentic carcinoma so produced, and concludes that, however sincerely the objection has been made, it is one more academic than real. In his own cases, save for that of one patient, he has never had occasion to administer more than two series of treatments. The patient can be accurately watched; the treatment may be supplemented or discontinued at any time. Even if we do not succeed, radical surgical methods can still be used. But in the hands of those who have used the Roentgen treatment, the results have been so happy that he feels that the experimental state has long since passed, and he cheerfully recommends it.

As he has hinted, few roentgenologists

know aught of gynecology; and, as he has also hinted, not all cases of dysmenorrhea or menorrhagia can be cured or relieved by the Roentgen rays. His aim is to bring about a cessation of the flow, an artificial menopause, as it were. If the patient is young the best that can be expected will be a temporary cessation; but even then she may be tided over and another chance given her. In case of older patients a returning menstruation can be controlled by another series of treatments. In older women the menopause will be permanent. But he insists upon a thorough gynecological examination and differentiates those cases requiring surgical intervention from those likely to respond to the Roentgen rays. It is only by such means that team-work can be done; and it is by this alone that we shall succeed.

THE EFFECT OF PROLONGED HYPERPNEA ON THE CHEMICAL CONSTITUENTS OF THE BLOOD.

COLLIP and BACKUS, in the *American Journal of Physiology* for April, 1920, states that the leucocytosis noted in some subjects as a result of hyperpnea is due probably to the mechanical factor involved. The lymph nodes in the thorax are directly stimulated by the excessive respiratory movements and as a result give up white cells. It was found in a control experiment on a dog that no increase in the white-cell count resulted after the intravenous injection of 1¼ grammes of sodium bicarbonate per kilo.

The development of definite tetany and "muscle cramps" in many subjects during hyperpnea appears to them of great significance. These manifestations are due, it would appear, to an alkalosis of the tissues.

These observations would lend support to the views of Wilson and others that parathyroid tetany is a form of alkalosis.

It is possible that the development of "cramp" in swimmers and also in runners may be due to a tissue alkalosis. The increased lung ventilation, in both swimmers and runners, may result at times in a proportionally greater carbon dioxide loss than production, and if such a condition did occur then a tissue alkalosis might result. Ether spasm may also be due to a temporary alkalosis resulting from hyperpnea.

SYPHILIS IN PREGNANCY AND LABOR.

In the *American Journal of Syphilis* for April, 1920, CORNELL and STILLIANS state that the treatment of the syphilitic during pregnancy is more essential and more difficult than the treatment before or after pregnancy. Many physicians seem to hesitate to use mercury and arsphenamine. The important fact to recall is—the kidney in pregnancy is called upon to do more work and is therefore subject to rapid and severe damage. The use of mercury may cause kidney damage and result in a toxemia of pregnancy. It has been their practice to institute active treatment, using intramuscular injections of mercury daily for one month, and also to give four increasing weekly doses of neoarsphenamine at the same time. If the disease is apparently very active, mercurial rubs are used the following month. The intramuscular course and neoarsphenamine are given every other month until delivery. The pregnant case usually receives at least two courses and occasionally four. After delivery the treatment is continued, increasing the interval until the Wassermann reaction is persistently negative. The case is followed for at least three years after the Wassermann becomes negative. The results of this procedure have been gratifying where the patient has been faithful in keeping her appointments. In most cases, however, the women fail in their part, for as soon as they feel better they think the treatment is unnecessary.

They have had no kidney lesions develop and no apparent bad effect from the active treatment. The teeth, which are so frequently affected by pregnancy, have not been a cause of any anxiety. The patient consults the dentist every other month. He is instructed to clean the mouth thoroughly at each visit and to repair temporarily any cavities which may develop.

Milk of magnesia is used as a mouth-wash at night and potassium chlorate in the morning.

MANAGEMENT OF PNEUMONIA, ITS COMPLICATIONS AND SEQUELÆ.

LITCHFIELD, in the *Pennsylvania Medical Journal* for April, 1920, states that some of his convictions in regard to pneumonia have changed in the past thirty years, but many of them have grown stronger and stronger since their inception, such as the importance of abundant water intake from the onset, 3 or 4 quarts per twenty-four hours; the value of air in motion; the benefit from oxygen inhalation in beginning cyanosis and air hunger; the efficacy of large doses of atropine, 1/50 grain every hour, in cardiac edema; the advisability of giving digitalis in generous doses before there occurs any so-called "indication for its use;" the unreliability of digitalin; the dangers of feeding during the early stages of pneumonia.

One of the gravest complications of pneumonia is abdominal distention. He believes this is greatly influenced by two controllable factors: (1) Feeding during the stage of onset or before the digestive organs can take care of the food given, and (2) the giving of opiates. There are cases in which the cautious use of an opiate seems to be the lesser evil, but it should not be routine practice. One or two nights with little or no sleep he believes a less hazard than the use of an opiate. The cough may be due to pleural irritation, and is sometimes relieved by hot applications, or it may be due to an accompanying bronchitis, when it may be relieved by steam inhalation or by the use of ammonium muriate 10 grains every two hours, or the use of a vaporole ammonium chloride inhaler. If the cough is exhausting in spite of these measures, or if the nervous vigil has deprived the patient of sleep for two nights, an opiate should be given. He prefers small doses of morphine, 1/20 to 1/16 grain, repeated by hypodermic hourly if necessary until the desired effect is produced. It is surprising to see how often a single small dose suffices. In selected cases, whisky or brandy, 2 to 5 ounces in the twenty-four hours, will relieve the cough or overcome the vigil. They are 50 per cent alcohol and therefore yield about 105 calories to the ounce.

Out-of-door treatment is better than open windows because of the better supply of air. It is air in motion and not cold air *per se* that is desirable. If the patient can be put outside he should be kept perfectly warm and comfortable all of the time. This means as much protection under him as over him. Many kinds of mattresses become quickly filled with cold air and carry off the body heat very rapidly. In such a case the patient should have from two to four good woolen blankets smoothly pinned to the mattress under him. A good hair mattress or box spring is the best bed to be had, but needs particular attention in respect to cold. If the patient feels that his bed is cold, more woolen blankets should be put under him and hot-water bottles or electric pads used temporarily. He has often found patients out-of-doors with plenty of covers over them, but with nothing but a cotton and a rubber sheet between them and the mattress.

THE WASSERMANN REACTION AS THE THERAPEUTIC INDEX FOR SYPHILIS.

OETTINGER, in the *American Journal of Syphilis* for April, 1920, states that although the practitioner shall avail himself of the Wassermann test for diagnostic data, must he not ask himself upon what, beyond a growing tradition based upon a postulate, is born the dictum to treat late neural syphilis until blood and spinal fluid become negative and not for a symptomatic cure? We know that in the so-called quaternary stage of lues (paresis) a positive reaction is practically unchangeable, that in tertiary syphilis the Wassermann reaction may remain positive despite sustained treatment, that the reaction becoming negative may later again show positive, that a seemingly obstinate positive after prolonged treatment

may later be replaced by a negative reaction without further treatment, that a negative may so remain or become positive after treatment, and, finally, that an individual with no symptoms may experience dire effects from vigorous antisyphilitic treatment instituted upon the sole basis of a positive reading—for instance, a fatal exfoliative dermatitis. The laboratory expert is in the dark, as we all are, as to unknown factors concerned in these varying conditions. However considering them, and necessarily putting to one side the consuming wish for an exact and absolute therapeutic criterion, because it does not yet exist, would it not be more scientific and more just to the syphilitic patient to depend upon clinical aspects of his case in respect to treatment as in time antecedent to a biologic test diagnostically invaluable? This thought is emphasized by the fact that meningovascular syphilis of the cerebrum rarely gives a positive Wassermann, so that under these circumstances, in the presence of symptoms not specifically characteristic, dependence upon laboratory findings may convey false security or distinctly result in a wrong therapeutic lead.

THE TREATMENT OF MENORRHAGIA WITH RADIUM.

In the *Virginia Medical Monthly* for April, 1920, BUDD states that radioactivity has little or no effect on the uterine musculature; in fact the uterus is the best physiological screen in the body, and it undoubtedly protects the pelvic organs from injury when large doses are used in the treatment of carcinoma. It is interesting to note that while the smooth muscle fibers of the womb are not sensitive to rays, fibroid tumors which are made up of unstriped muscle fibers and fibroelastic tissue are much affected by prolonged radiation and often disappear after one treatment.

The ovaries are easily damaged by radioactivity. The rays seem to have a selective action for the Graafian follicle. After a prolonged dose the cells in the stratum granulosum commence to show destructive changes, while the ova are somewhat more resistant, but they too are destroyed by a large dose. Eight or ten days after a long radiation the entire structure of the Graafian follicle is lost and the symptomatic results of such changes are much in evidence. According to Corscaden "this effect is one of the most striking of all those caused by the rays on any of the structures of the body."

The causes of menorrhagia are numerous and varied. Anatomical lesions within the uterus, such as chronic metritis, endometritis, ulceration, laceration, prolapse, involution, faulty position, are often associated with excessive bleeding; while extrauterine conditions, such as high blood-pressure, faulty circulation, a tendency to bleed due to a delay in the clotting time of blood as seen in blood disorders, syphilis, endocrine disturbances, inflammation of the adnexa, may cause a moderate or a profound menorrhagia. The bleeding in a vast majority of instances is due to local anatomical lesions, but a few cases are induced by conditions quite remote from the pelvis, and especially is this true in the menorrhagia of young women.

Excessive menstrual flow may offer barriers to successful treatment. Some cases do well on simple medical remedies, other cases are benefited by a D. and C., and still others resist all forms of therapeutic remedies no matter how well or skilfully directed. No condition can tax the ingenuity more or call for more gynecological judgment than menorrhagia. All gynecologists have been confronted with the problem of patients returning with symptoms just as severe as when first seen, and after several local operations have been forced to remove the womb in order to relieve the patient of her troublesome and dangerous symptoms, and themselves of the responsibility of her run-down and exsanguinated condition.

Fifty cases of menorrhea not associated with carcinoma and large fibroids have been treated with radium. Some of the cases had to return for two or more radiations before they obtained the desired relief,

but it has not been necessary to advise the removal of the womb in a single member of the group.

In regard to the treatment of menorrhagia with radium, Clark aptly sums up the situation when he says: "As we view this question, three essentials are capital in the use of radium: first, an accurate diagnosis in all cases; second, the proper selection of cases; third, the careful graduation of dosage, beginning when young women are being treated with a minimum application and increasing the duration of the application slightly if the first attempt fails to check the excessive flow."

Budd's technique for the application of radium differs little from that employed by Stacy, Clark, and others. He does a simple D. and C. and swabs the uterine cavity with iodine and applies the radium in a silver capsule screened with 1 mm. brass. In short radiations he does not screen with rubber, as Clark and others advise, for he does not believe that the secondary rays have the same destructive effects on the endometrium as they have on superficial epithelium. The amount of radiation depends largely on the age of the patient and the condition that is to be treated.

In young women under thirty-five years of age he seldom gives more than 300 to 400 mg. hours in a single treatment. This is a small dose, but an application of twice as many mg. hours may bring about a sudden termination of the menses—a condition not to be desired. He allows three months to elapse, and if the menstrual flow has not returned to normal he advises a second application. The first period after radiation is often associated with menorrhagia, but the flow during the second period is usually not excessive, and at the third period a normal state is reached.

In women above thirty-five years of age he gives a little larger dose, and he seldom has to give more than one treatment to bring about the desired effect. Where there is no fibroid and the menorrhagia results from a hypertrophic endometritis or a chronic metritis, he usually gives 500 to 700 mg. hours of radiation. In cases in which the larger doses are used it is not an infrequent occurrence for the patient to have several irregular periods and then have menstruation cease entirely.

Budd has not made a practice of advising radium in the treatment of fibroid tumors, but in treating patients for menorrhagia associated with fibroids he has seen fibroids entirely disappear. He has had two patients in the past six months for whom he advised radium for the excessive bleeding, and when they returned to have the womb removed for the fibroid he found the tumor had entirely disappeared.

After a radiation the patient may suffer symptoms of intoxication such as nausea, and a slight elevation in temperature, but the symptoms are not alarming and subside within twenty-four hours. After the menorrhagia ceases the patients soon regain their health and hemoglobin. He knows of no condition in which "come back" both mental and physical is quite so rapid.

WASSERMANN CONTROL IN THE TREATMENT OF SYPHILIS.

SARGENT, in the *American Journal of Syphilis* for April, 1920, states it is a common clinical observation that syphilis may be suppressed by treatment to the point of a negative Wassermann, and yet in the course of time the Wassermann may return strongly positive. It seems altogether plausible that so long as the Wassermann remains negative, the spirochetes, though not eradicated, are rendered avirulent, whereas a return of a positive Wassermann indicates merely that the organisms have regained their virulence.

In those instances in which a positive Wassermann has, by prolonged treatment, been rendered negative and remained so for several years, it seems entirely plausible that such a case may be considered clinically cured, a negative spinal fluid permitting.

So, in reviewing the instances in which a negative Wassermann is found in the presence of syphilis, we find that it is really

to be expected in very early syphilis, in malignant syphilis, and in syphilitics extremely ill or moribund; in untreated syphilitics, whose individual resistance has been sufficient to suppress their disease; and in those syphilitics who have had sufficient treatment to suppress their infection either temporarily or permanently.

"A negative Wassermann means nothing" is an expression very frequently heard. Like most idioms it is born of an excellent idea, but very often misleading. As a matter of fact a negative Wassermann properly done and properly interpreted does mean a great deal, both in the diagnosis of syphilis and as a control in its treatment.

In the consideration of a negative Wassermann it may be truly said that it means nothing to him who fails to consider the history and physical findings of his patient. A positive Wassermann would mean but little more.

As a matter of fact, however, a negative Wassermann in one giving neither history nor evidences of syphilis practically means that that individual has never had syphilis. A negative Wassermann in one complaining only of a generalized rash means almost to a certainty that that rash is not a secondary rash. A negative Wassermann in one giving a definite history of an untreated syphilis some years old probably means that that individual has, through his own physical resistance, at least temporarily suppressed his infection. A negative Wassermann in an individual who has been under intensive treatment means nothing more than that such treatment has temporarily at least suppressed his or her syphilis. Repeated negative Wassermanns over a period of several years mean that the disease has probably been permanently suppressed or clinically cured.

In the consideration of a negative Wassermann in those individuals whose syphilis is years old and remains inactive, as well as those individuals who are under active treatment, one thing must always be borne in mind. Craig has demonstrated beyond question that in individuals whose syphilis is apparently latent the Wassermann frequently varies from month to month. One month it may be negative, two-positive the second month, four-positive the third month, while by the sixth month it may again become negative. Because of this it is necessary that a Wassermann be found negative repeatedly before it is permissible to expect that syphilis in such a case is even temporarily suppressed. Even then, before a final conclusion as to its cure is reached, the spinal fluid must be found Wassermann-negative because repeated clinical observations have demonstrated clearly that the spinal fluid Wassermann frequently remains positive for some time after the blood has become negative.

So much for the significance attached to a negative Wassermann. The interpretation of a positive Wassermann is much less difficult. It has been established beyond question that the Wassermann test is found positive quite consistently in yaws. The various explanations of this are all open to refutation. Because of the close similarity of yaws clinically, pathologically, serologically, and therapeutically there seem at least good grounds for the assumption that yaws is a disease at least very closely allied to syphilis, if not actually it in a distorted form. If such is ultimately shown to be the case, our confidence in the Wassermann will be materially increased.

Time and again suspicion has been thrown upon the Wassermann by instances in which a positive reaction was found in other diseases clinically recognizable as such, *e.g.*, tuberculosis, cancer, leprosy, and even in acidosis. That tuberculosis as such, or cancer as such, can produce a Wassermann is as yet far from proved. This much is certain: a positive Wassermann is the exception rather than the rule in such diseases. With this as the case it may yet be clearly shown that the tuberculous and cancerous patients have a positive Wassermann because they also have syphilis.

Yaws in this locality is a medical curiosity, so only on the rarest occasions could it be confused with syphilis. Though the possibility of cancer, tuberculosis, and leprosy giving a falsely positive Wasser-

mann cannot be denied, it seems so improbable that the better part of wisdom appears to indicate that that patient be considered syphilitic.

Throughout this paper reference has not yet been made to what is probably the greatest single factor that has tended to discredit the Wassermann in the eyes of the clinician, namely, errors in the Wassermann, not inherent in its system, but the result of improper technique. Sargent has frequent evidence that such a danger exists. Failing to appreciate this occasionally an incompetent is allowed to do Wassermanns, and even the most skilled technician is, with all of us, not infallible. There is constantly danger of mistaking a diagnosis.

EFFECT OF CARBOHYDRATE DIET ON PANCREAS FUNCTION.

JENSON and CARLSON, in the *American Journal of Physiology* for April, 1920, in concluding an article on this topic remark that their results support the view that a liberal carbohydrate diet tends to change diabetes levis into diabetes gravis, after partial pancreatectomy in dogs. But their experiments do not constitute a clear demonstration of this thesis—in fact they are not much more conclusive than the experiments reported earlier by Thiroloix and by Allen.

It seems to them that the question can be settled by the statistical method only, using a great many animals for the work, because of the fact that one cannot predict the metabolic course of any one animal deprived of approximately seven-eighths of the pancreas. When a considerably smaller pancreas remnant is left the dog passes into fatal diabetes irrespective of the diet; if the pancreas remnant is somewhat larger no amount of forced carbohydrate feeding induces diabetes gravis. And since the functional efficiency of the pancreas appears to vary in different dogs, the estimation, by weight, of the optimum pancreas remnant for the solution of this question involves a large and variable error.

The analogy from an impaired digestion is not to the point. It is true that ingesting certain foods, or any food in certain amounts, may aggravate the untoward condition of an alimentary tract whose digestive juices and motor power are much below normal, but this is not due to any "overstrain" of the digestive glands, or of the gastrointestinal motor mechanisms. It is due to stasis, bacterial fermentation and putrefaction, and to abnormal reflexes evoked from hyperirritable gut.

The view of organ impairment as a direct result of physiological "overstrain" is simple, is readily strengthened by analogy, and, viewed with little or no critical analysis, appears so reasonable that it is being used as sufficient explanation of results in physiology and medicine to a greater extent than the facts warrant. It is true that excessive stimulation of the eye or of the ear leads to degeneration in the retinal and cochlear elements. But it is equally true that surgical removal of a large percentage of such glands as the kidneys, the thyroid, etc., causes hypertrophy, not atrophy, of the gland remnants, unless the gland remnant is so small that conditions are produced in the body which are inimical to growth and repair in general. The facts in regard to the thyroid gland are the most striking in this connection. When one attempts to completely extirpate the thyroid in young animals (rabbits, chickens), it frequently happens that a few thyroid cells (less than 1/100 part of the gland) are left *in situ*. These few cells invariably multiply up to a point where the gland substance meets the internal needs of the animal. We must assume that when a few thyroid cells are called on to function for the entire thyroid gland, these few cells are being greatly overstimulated, as compared to the normal. Nevertheless the result is hypertrophy, not atrophy.

When the functional capacity of the pancreas remnant is too small to prevent diabetes, the pancreas remnant undergoes practically no hypertrophy. On this point their results are in agreement with those of previous workers. This failure to hypertrophy may be due to the unfavorable influ-

ence on growth in general of the diabetic condition, rather than to specific "overstrain" of the pancreas remnant.

The favorable effects, at least in many cases, of partial starvation in the management of diabetic patients cannot at present be ascribed, in whole or in part, to relieving an impaired (endocrine) pancreas from the "overstrain" of ordinary diets, in view of the indications from human and comparative physiology that starvation, within limits, tends to rejuvenate tissues in general.

TREATMENT OF ECLAMPSIA.

MARTIN, in *Northwest Medicine* for April, 1920, states that it is the morphine treatment of eclampsia with which he has had some experience. In the treatment of developed eclampsia the pregnant condition of the woman, if the attack be antepartum, is disregarded by him. Forceful delivery, Cæsarian section, or even the simple induction of labor have no place. The patient is treated medically as a toxemic. If she falls into labor, which is by no means desired though usual, she should be permitted to deliver spontaneously. At most an episiotomy may be done or low forceps applied with the head on the perineum without progress, or upon the evidence of fetal distress.

It has occasionally occurred that the woman when treated medically recovers undelivered from her eclampsia, goes several weeks to term, and gives birth normally to a live baby without recurrence of the convulsions. The frequency of convulsions developing or persisting postpartum is an indication that delivery alone is of questionable importance.

Martin reviews somewhat in detail the treatment of eclampsia as outlined by Tweedy, because he insists that the good results obtained depend upon a strict adherence to these details, and that no one of them may be safely disregarded. Upon the appearance of convulsions, an initial dose of morphine is given hypodermically, gr. ½, together with 1/100 grain of atropine sulphate. One-quarter of a grain of morphine without the atropine is given in the same way every two hours up to 2 grains in twenty-four hours, or until the respirations are down to six per minute or the convulsions cease. Polak gives ¼ grain of morphine every hour after the initial half-grain, but does not give the atropine. He stops the morphine when respirations reach eight per minute, a somewhat safer minimum it would seem.

If the patient is conscious and able to swallow, a drastic cathartic is given, repeated in fifteen minutes if vomited, and followed by large amounts of plain water. The nature of the cathartic is immaterial. It should be effectual. If she is unconscious, a stomach tube is passed, and the stomach irrigated until the water returns clear. If she is intractable, it may be necessary to wait for this until she is under the influence of the morphine. The stomach is emptied as nearly as possible because of the danger of regurgitation. Through the tube still in the stomach is poured a drastic cathartic, 2 ounces of castor oil with three drops of croton oil, or 3 ounces of magnesium sulphate crystals, dissolved in the smallest amount of water. The bladder is emptied by catheter. Little urine is usually found, and catheterization is repeated only for distention.

The patient is now turned on her side and the bowel is irrigated as was the stomach, until the return water becomes stained with feces. This process is slow, and often several gallons of water may be required. At the end of the rectal irrigation, if the patient be unconscious and unable to take water by mouth, a solution of soda, one drachm to the pint, should be introduced through the tube to be retained. At the end of eight hours, if the bowels have not moved spontaneously as the result of the purgative, the colon should be washed out again. If, at the end of a further six hours, the bowels have not acted, a second physic should be given. The bowels should move four to six times in the first twenty-four hours.

Following the initial dose of morphine,

if the patient be unable to take liquids by mouth, a hypodermoclysis of sodium bicarbonate solution or normal salt is given, regardless of the presence of edema. This may be repeated in eight hours, if no improvement in the condition occurs. Tweedy places a hot linseed-meal poultice to the loins, and renews it every two or three hours. He believes it assists in restoring kidney function.

Of particular importance in preventing aspiration of saliva or vomitus and asphyxiation, due to swallowing the tongue, is the posture of the patient. Tweedy insists that the patient be left constantly on the side, that salivary accumulation escape to the surface, and believes that two of the cases for which he was responsible, but which he did not see throughout, died of asphyxiation. When one considers the frequency of posteclamptic pneumonia, it is possible the neglect of this simple preventive measure is at fault.

The general care of the patient otherwise, as to the prevention of injury during a convulsion, the stimulation for cardiac failure, oxygen and artificial respiration for cyanosis and asphyxia, present nothing apart from the usual practice.

Following the cessation of the convulsions and return to consciousness, water may be given freely, but not food for twenty-four hours, not even milk. Tweedy believes that the early administration of food following apparent recovery from eclampsia is the cause of recurrence of convulsions, and in one case was the cause of death. It has seemed to him that the early administration of milk, the article usually selected, was a factor in producing delirium in several cases after an interval of consciousness. Withholding food for forty-eight hours and then starting with clear coffee or tea, with or without sugar, dry or buttered toast, and vegetable gruels, all without milk, prevented this toxic insanity; at least it did not occur.

In the treatment of the rare manifestations of eclampsia without convulsions, with its low blood-pressure, profound coma, and relatively high mortality, it would seem that morphine is unnecessary and that elimination as outlined and stimulation would be indicated.

No attempt is made to control the convulsions by the administration of inhalation anesthetics; the patient is not bled, not sweated, or given veratrum viride. A spinal puncture is not done. Vapor baths and other means to promote diaphoresis are apparently improper procedures. Eclamptics are suffering from a scarcity of fluid in the circulation, and this in spite of their tissues being possibly solid with edema. What is greatly wanted is a less saturated condition of the blood, and it is hard to suppose that profuse sweating can have any other action than to increase this abnormality. The amount of toxins eliminated by the skin is a question not answered. Hot packs and baths are not without danger of producing collapse.

Chloroform is closely associated in its effects on the liver and other organs with the eclamptic poisons, and for that reason should not be used. Ether is slow in its action, while nitrous oxide is likely to elevate to a dangerous point an already high blood-pressure. The short warning given of an impending convulsion is hardly sufficient to allow for the administration of enough of any anesthetic to greatly modify the fit.

Veratrum viride remains a favorite drug in the hands of many. Its principal action is upon blood-pressure, which might justify its use were elevated blood-pressure the only symptom to be relieved. High blood-pressure eclampsia, as in nephritis, is a compensatory process. Rarely does blood-pressure give concern, except as it indicates on the one hand a profound toxemia, or on the other a beginning cardiac failure. When shall we reduce a high blood-pressure, and to what point? Venesection is a measure which theoretically has much to recommend it. By it blood-pressure is reduced, usually only temporarily. By means of it toxemia is relieved, absorption of edema favored, with an ultimate increase in circulatory fluids. Beck, of Brooklyn, bleeds for a systolic pressure of 175 milli-

meters of mercury or more; DeLee bleeds only postpartum. Moderate postpartum hemorrhage has long been held an adjuvant measure of value, but it is difficult to control. Because of that uncertainty and difficulty of control, it would seem best to perform venesection after delivery, when the blood lost at delivery is a known quantity.

SOME PRINCIPLES SELDOM RECOGNIZED IN THE TREATMENT OF SYPHILIS.

GRAVES, in the *Medical Record* of June 19, 1920, states that remembering the protean manifestations and the chronic and insidious nature of a syphilitic infection and our inability to know its termination in any individual save by reinfection, are we not for these reasons justified in holding firmly to the principle that a known syphilitic should be the object of medical observation and study throughout the remaining years of his life? By this is not implied constant medication or any medication whatever after the first three to five years, unless a complete restudy of the whole individual at least once in each year should indicate further medicinal treatment. He asks, Does not accumulated clinical experience in the problems of syphilis justify the general acceptance of this principle? This principle will meet with many objections, chief among which will be that such concern on our part about the disease will unnecessarily alarm patients and make of them syphilophobics. We do not hesitate, however, to educate our tuberculous patients, to speak frankly to the individual about his organic heart disease, to keep the chronic nephritic under constant observation, to be solicitous about the patient with diabetic symptoms, and our frankness in such conditions leads only to good, because we thereby educate and thus secure the earnest coöperation on the part of such patients. Then why have we been less frank with syphilitic patients or less solicitous about them when all clinical experience teaches that we are dealing with an infection in many individuals the chronicity of which can be compared with no other prevalent, communicable disease? The answer is: Our therapeutic triumphs have heretofore blinded many of us to the teachings of clinical experience and the natural history of treated and untreated syphilis.

No man can deny the brilliant, one might say miraculous, results of our so-called "specifics" in the prompt relief of many of the manifestations of syphilis, but let us hesitate to interpret these results as other than symptomatic cures. The prompt disappearance of some symptoms and some physical signs and the natural history of treated, as well as untreated, syphilis should convince us that the same mechanisms of defense are at work in the human organism in the presence of a syphilitic infection as in any other infection, and that our remedies do not act directly as spirocheticides and sterilizers, but rather as stimulators of the defensive mechanisms inherent in the host. Let us aid these, if we may, through drugs, but while we are trying to do so, let us not forget that these mechanisms are the syphilitic's most valuable asset in his struggle with his infection. Let us educate him in the nature of his infection—give him neither false security nor undue alarm about it. Let us teach him that right living and drugs are equally important and that constant vigilance throughout his life is the price of his safety. Let us make him feel, if he will thus live, that in all probability he will lead a relatively healthful and useful life in spite of his infection—a more healthful and useful life than he who lives riotously, even though he be free from such infection. Let him know that clinical experience teaches that the syphilitic need deny himself nothing that life affords when used in moderation, but for the welfare of his potential mate and descendants—for the welfare of the race—that he should gladly deny himself the privilege of marriage.

With such therapeutic principles, as herein discussed, to guide us, we shall find more to do for the syphilitic than in trying to convert his positive Wassermann reaction into a negative one; we shall then

think more about the individual and less about his disease; more about strengthening his inherent resistance to, or increasing his tolerance for, his infection, and to this end we shall find many ways in addition to the use of remedies. Confessing the limitations of our measures and remedies, yet fully conscious of the great good to be derived from them, may we not through a more general recognition of their limitations and through the education of the masses more nearly approach the ideal cure—the prevention of syphilis?

When we shall become less certain about our cures of syphilis—think more about the individual, the consort and progeny—may we not then reasonably anticipate the dawn of a better day for the syphilitic and the dawn of a brighter day for many of the race?

TOXIC JAUNDICE IN PATIENTS UNDER ANTISYPHILITIC TREATMENT.

Writing in the *Archives of Internal Medicine* of June 15, 1920, BAILEY and MACKAY report on the chemical blood and urine analyses in twenty-five cases of toxic jaundice following combined arsenical and mercurial treatment for syphilis, on two cases of catarrhal jaundice, on one case of syphilitic hepatitis, and on twelve cases in which patients were recovering from illnesses not associated with the liver.

Arsenic tests were made on the morning urines at periods ranging from 24 to 157 days after the last treatment and none was found. The twenty-four-hour urines were normal, excepting for pathological pigments in some of the cases.

Patients clinically jaundiced had bile pigment in their urine. Bilirubin estimations in the plasma, according to Blankenhorn's dilution method, compared favorably with Gmelin's tests and the clinical findings.

Of the liver cases, those patients with bilirubin in the plasma excreted more than twice as much urobilinogen as did those patients who were free from jaundice; the non-jaundiced liver patients excreted more than twice as much as the well persons. Of the cases not associated with disordered livers, the debilitated patients had more than twice the urobilinogen excretion of the well persons.

In the twenty-eight liver cases, the rate of excretion of urobilinogen was one-third greater in the early morning than was the average rate during the day.

In the urines the relative oxidation of urobilinogen to urobilin was greatest in the well persons, less in the debilitated persons; about one-third as much in the non-jaundiced liver patients, and still less in the jaundiced liver patients. The relative oxidation was greater in the early morning than in the twenty-four-hour specimens.

The patients with toxic jaundice had a marked increase in blood cholesterol; the jaundiced patients (being also the severe cases) had the greatest increase. In the cases not associated with liver disturbance the cholesterol value was normal.

Sugar estimations in blood and urine revealed no disorder of carbohydrate metabolism.

Blood creatinin estimations showed no marked departure from the normal. Uric acid estimations in the blood and urine indicated an increased production of this substance.

The values for urea nitrogen are normal in the well persons. Of the remaining cases, some patients show normal values, but the majority are above normal. This seems to be due to the high protein diet and deficient physical restrictions placed on these men.

The effect of exercise on debilitated patients seems to be to decrease the excretory power of the kidneys, increase the waste products in the blood, and lower the resistance of the liver to toxins. This, associated with an increase in the diet proteins, is given as an explanation of the "delay" in poisoning by arsenobenzol, chloroform, etc. Arguments are advanced for the adoption of a diet rich in carbohydrate and very low in fat and protein in the treatment of syphilis.

They conclude:

1. In patients whose livers are damaged by arsenobenzol derivatives, an increase of

cholesterol in the blood is an early and marked sign; it persists after other clinical signs have disappeared; its routine estimation may be of value in detecting the onset of liver injury in patients under antisyphilitic treatment.

2. In debilitated patients the oxidative activity of the urine is decreased. This decrease is much more marked if the liver is disordered. In such cases the oxidative activity is greatest during absolute rest.

3. Exercise should be restricted greatly during the course of antisyphilitic treatment and for the following few weeks.

4. A diet, rich in carbohydrate and very low in fat and protein, should precede, accompany and succeed the administration of arsenobenzol derivatives in the treatment of syphilis.

5. Increase of protein in the diet, and of exercise, should be controlled by the estimation of the urea in the blood.

6. The appearance of toxic symptoms in delayed poisoning by arsenic, phosphorus, chloroform, etc., is possibly due to the premature increase of protein in the diet, and of exercise in these cases.

MECHANISM OF PLACENTAL SEPARATION AND EXPULSION DURING THE THIRD STAGE OF LABOR.

HART, in the *Edinburgh Medical Journal* for April, 1920, states that if the Crédé method is used to separate the placenta and membranes above the retraction ring, whether early or late, the result is a great danger, viz., that small bits of placenta and larger pieces of membrane may be left *in utero*. The risk of the former being unseparated and left is slight, but placental tissue over the uterine ends of the Fallopian tubes may be left behind, as he has seen postmortem. It is often said that the leaving of bits of membranes behind will lead to no harm if the labor has been conducted with all antiseptic and aseptic precautions. This is a most dangerous error. The antiseptic and aseptic precautions employed are and always will be relative, not absolute. We cannot have absolute asepsis, and thus when dead material is left behind it will necessarily be invaded by microörganisms, which will break it up, may penetrate further and form their toxins.

The third stage should be managed therefore as follows: The patient should lie at the edge of the narrow bed in the semidorsal posture, with the porcelain slipper below. The attendant holds the body of the uterus through the abdominal walls, and can see the external genitals, so as to note if any laceration hemorrhage is going on.

He does not need in an ordinary case to reënforce a pain when it comes on. This would, if continued, merely so overstimulate the uterus as to bring on inertia. After each pain the uterus is less firm and the uterine cavity increases in area slightly. How often did one not see, when the Crédé method was employed early, that the woman bled, and went on bleeding, the more conscientiously the attendant went on squeezing.

Within the first twenty to thirty minutes, but possibly later, an important change takes place. The uterus becomes smaller as the placenta is now separated and lying in the lower uterine segment, when it can be felt suprapubically; if not, it is in the vagina. Even then one can wait, and often the patient strains and the whole mass is expelled. When emerging, it can be caught in the hand, and one can then feel by a slight tug whether it is free above or tied back by a little tag of membrane in the lower uterine segment.

If the mass lags, suprapubic pressure in the line of the brim-axis, and necessarily on the uterus, will help. Sometimes it is delayed in the vagina if the latter is well curved, but if the gloved finger pulls the posterior vaginal wall back, pressure above will send it out. Time in the third stage is important, and Hart always imposes on himself an hour limit for it before interfering if hemorrhage is not going on. The membranes expelled are the amnion,

chorion, and compact layer of the parietalis external to these. The cleavage takes place in the spongy layer of the parietalis. The amnion is tough and resistant, the chorion and parietalis are less tough and may not cleave precisely if hurried while stripping off. One should always view the membranes while examining them through the amnion, so as to see if the layers of the chorion and parietalis are too patchy. If so, one notes it for future guidance, but removal is not necessary or even possible; the amnion is the dangerous membrane when retained.

The Crédé method for the separation of the third-stage placenta and membranes has been a very serious error in obstetric technique, and has persisted far too long. Its early use leads to premature interference, and it is Hart's firm belief that its practice has caused great mischief by leaving the cavity of the uterus with bits of unseparated membrane and with thromboses, giving a nidus for infection. Ragged membranes are far too common in hospital and private practice. The placenta and membranes if left alone are separated at first in discrete areas, and if expression is then used the separated parts of membranes especially get torn away from the unseparated: besides, the deciduæ and chorion are far too patchy when viewed through the amnion.

The sphere of any septic infection by the attendant begins mainly when the head crowns and includes the area bared by the separation of the membranes and placenta. Down to the approaching end of the second stage the chance of infection is slight. A personal inspection of placenta and membranes should be made by the obstetric surgeon on his first visit to hospital, and it would be a good thing if the obstetric registrar prepared a record of the state of all placentæ and membranes and of their relation to morbidity and mortality.

Finally, Hart's special suggestion is that the introduction of the Crédé method is responsible for a rash and loose technique, which must be strenuously combated.

TREATMENT OF BENIGN TERTIAN FEVER.

ACTON, in the *Lancet* of June 12, 1920, states that as far as can be reasoned from a chemical study the parasiticidal action of the cinchona alkaloids is dependent on three factors in the complex alkaloidal molecule:

(*i*) The group occupying position 6 in the quinoline ring. Cinchonine is very toxic for man, but the substitution of a methoxy group (CH_3O) in the quinine series decreases the toxicity without materially altering the parasiticidal action. Grimaux and Arnaud have shown that toxicity increases with further increase in the size of the radicle occupying this position.

(*ii*) The vinyl group ($CH:CH_2$) in the quinuclidine system. The vinyl group is replaced by a carboxylic group (COOH) in the formation of quitenine and cinchotenine, and Ramsden has found quitenine inert against the malarial parasite. The inactivity may be due to a chemical reaction between an acid and the alkalies of the plasma. The vinyl group is not a decisive factor, as it is present in cinchotoxin and quinotoxin, and both these keto-bases have no parasiticidal action against the malarial parasite. The hydrogeneration of the vinyl group ($CH:CH_2$) to $CH_2.CH_3$ in the hydro-alkaloids renders such alkaloids more difficult to oxidize, and they are accordingly not easily broken down in the body tissues. This may increase their parasiticidal action. MacGilchrist has shown that hydroquinine has a more potent action than quinine on the malignant tertian parasite.

(*iii*) The grouping of the quinuclidine system around the asymmetrical carbon atom at (3), as shown by the optical rotatory power. We have seen that the asymmetrical carbon atoms at (1) and (2) in the cinchonine and quinine series are all similar and therefore need not be considered further. In the formation of cinchotoxin and quinotoxin the asymmetry of the carbon atom at (3) is destroyed and the parasiticidal action is also destroyed.

In cinchotenine and quitenine, on the other hand, the asymmetry is still preserved, yet these substances have no therapeutical value. So that the asymmetry of this carbon atom is essential but not decisive.

The levorotatory alkaloids, quinine and hydroquinine, have a specific action on the malignant tertian parasite, whilst the dextrorotatory alkaloid quinidine (hydroquinidine has not been tested as yet) is more powerful than quinine in its action on the benign tertian parasite. The corresponding levorotatory isomeride cinchonidine behaves very similarly in its action on the benign tertian parasite. Both these isomerides are much less toxic to man than quinine. He therefore concludes from this chemical study that:

1. The methoxycinchonines — viz., the quinine series—are less toxic than the cinchonine series.

2. The hydro-alkaloids are more stable.

3. That the levorotatory alkaloid quinine is a specific for the malignant tertian parasite, whilst the dextrorotatory alkaloid quinidine is the best alkaloid tested so far for the benign tertian parasite.

IMMUNIZATION AGAINST DIPHTHERIA.

BLUM, in the *American Journal of Diseases of Children* for July, 1920, reaches these conclusions:

1. Schick tests made on 1076 children in an institution during a period of five years show that a negative Schick test is evidence of the presence of sufficient antitoxin in the tissues to protect the individual against diphtheria infection.

2. The moderate or slightly positive tests denote an insufficient amount of antitoxin in the tissues to protect the individual. The tests called very faintly positive show possibly sufficient antitoxin to protect; however, it is possible that the transfer of virulent organisms to these individuals may cause them not only to become carriers but to suffer from a superficial infection without any constitutional toxemia.

3. Tests made on seventy-two families showed that the younger members of the same family usually gave corresponding reactions to the Schick test. Where variations did occur, the younger member gave usually the positive and the older the negative reaction. Infants under six months, because of the transmitted immunity of the mother, were exceptions to this rule.

4. Changes in the Schick reaction from negative to positive during the first three years of life, due to the loss of an inherited immunity, were found to be sufficiently numerous to justify retesting during this period at intervals of a few months. This procedure is especially desirable in infant asylums.

5. The full duration of the active immunity conferred on individuals susceptible to diphtheria by the injection of toxin-antitoxin is not yet ascertained. In one series of cases the immunity persisted in 100 per cent of a group of fifty children for at least twenty-two months. Workers in the research laboratory have found that the immunity once acquired lasts for at least four and one-half years.

6. It is possible to render a child-caring institution diphtheria free. This has been accomplished for a period of five years at the Home for Hebrew Infants by injecting all susceptibles with toxin-antitoxin mixtures.

CHRONIC LEUCORRHEA: ITS PATHOLOGY AND TREATMENT.

CURTIS in the *Journal of the American Medical Association* of June 19, 1920, states that he considers only chronic leucorrhea, and that most acute discharges tend to improve spontaneously. Remedies too numerous to discuss have been extensively used. These include curettage, treatment of the uterine cavity, applications to the lower cervix, vaginal douches, administration of glycerin or other hygroscopic solutions, vaginal tampons, various kinds of powders, and vaccines. He has tried them all with very indifferent results.

According to his interpretation, most popular procedures are not sufficiently

directed toward the pathology of leucorrhea. Deep cauterization of the cervix, as employed by Hunner, is theoretically of value, and is said to be helpful in selected cases.

In the series he reports the patients have been subjected to a thorough pelvic examination, the reaction of the discharge tested, smears obtained from the cervix and vagina, and a set of cultures made.

Gross pathologic lesions are corrected surgically. The usual hygienic measures are instituted.

The most usual and most difficult focus to eradicate lies in the endocervix. Unless the discharge is essentially of vulvovaginal origin, radium is advocated in all severe cases of persistent chronic leucorrhea. After thorough dilatation, the cervix and fundus may be curetted for diagnostic purposes.

Fifty mg. of radium, preferably two 25-mg. tubes in tandem, are introduced high into the cervix, held by a suture passed through the external os, and left for several hours. One or more subsequent radium treatments of shorter duration may be required. It is thought best to plan on an interval of from ten to twelve weeks' duration between applications.

Each radium tube employed in the treatment of his series of cases has been screened by a double gold capsule with a total thickness of 2 mm. The capsule in turn has been encased in dental rubber. At present the screen has been reduced to a single rubber-covered gold capsule of 1 mm. The duration of application has been correspondingly decreased.

Examination of cervical tissues after successful radium treatment reveals atrophy of the glands, a relative increase in fibrous tissue, and the disappearance of any microscopic evidences of infection.

Skene's ducts harbor the next most important focus. At the time of radium application, or under procaine anesthesia, the blunt end of a needle, held in forceps, is threaded into the duct lumen, and its end is forced through the base of the duct so that the needle head protrudes into the vagina. The duct is split with a knife and the tract fulgurated.

Bartholin duct infection may be eradicated by similar treatment. Infected Bartholin glands rarely require excision.

The urethra is occasionally treated by dilatation, aided by instillations of weak silver nitrate solution.

CONSERVATION OF THE MENSTRUAL FUNCTION.

MAYO, in the *Journal of the American Medical Association* of June 19, 1920, reiterates his belief that conservation of the menstrual function is of the utmost importance even if pregnancy is not possible, and that the surgeon who faces the necessity of removing the uterus or the ovaries, and the bringing about of all those endocrine changes attending the procedure, is taking a serious responsibility which must not be assumed lightly. The heredity of the patient is responsible for the nervous instability, but the operation may be the match which lights a fire, in the ashes of which the patient finds herself unable to readjust her life to her living condition.

SOME OF THE NEWER WORK ON NEPHRITIS.

In the *Military Surgeon* for July, 1920, KREMERS states that Janeway gave a classification of nephritis which is most useful. It is such a classification as can be used as a guide to the management of the case and to the prognosis. This is as follows:

1. Patients in whom albumin and casts in the urine are the only evidence of disease: (*a*) Instances of a healing acute lesion. (*b*) Instances of postural albuminuria. (*c*) The remaining cases.

Evidence of healing may be found in the history of recent mild infection, tonsillitis, pregnancy, syphilis, some intoxication or the administration of salvarsan. In such cases rest in bed on a milk or other bland diet may clear up the condition. If a week in bed on such a diet does not cause improvement, such rigid treatment is prob-

ably useless and search should be made for a focus of infection or toxemia.

Postural or orthostatic albuminuria may be determined by testing the urine at different times of the day, or by causing the patient to stand for fifteen or thirty minutes in a markedly lordotic position. In such cases of albuminuria it has been noted that there is a larger amount of proteid precipitable by acetic acid in the cold. Casts may also be present. The treatment should be gymnastic exercises to correct the faulty posture with general tonic invigoration. The diet should be simple but not too restricted. The phthalein test will probably be normal.

The third subgroup includes a large number of conditions. We should look for stone, new growth, focal infection in the tonsils, teeth, seminal vesicles, prostate, a toxic cause such as arsenic or other inorganic poison, intestinal fermentation or catarrh. If no cause is found the case should be kept under observation and functional tests carried out. Until these tests show impaired function specific treatment is not indicated except to safeguard the kidneys against unnecessary strain.

Avoid: Excessive physical strain; exposure to cold and wet; alcohol or excessive tobacco; condiments, pepper, mustard, and spices; foods rich in creatinin and poor in nutritive value, such as meat-stock soups and broths; the use of salt, except in extreme moderation.

2. Patients with hypertension, with or without a trace of albumin and with slight subjective symptoms or none at all.

These are commonly classed as vascular or sclerotic hypertension or cardiovascular hypertensive disease (benign sclerosis or hyperpiesis).

A safeguarding treatment is sufficient. It includes:

The avoidance of emotional or mental strain as a cause of pressure rise.

The securing of adequate sleep, and preferably a midday rest; moderation in the use of tobacco; watching the effect on the blood-pressure.

The avoidance of excessive physical exercise, which should not be employed to the point of fatigue or anginoid pain. When exercise cannot be taken, massage is helpful.

Limitation of diet, including condiments, meat-extractives, and, lastly, particular emphasis on not overeating. Meat need not be excluded from the diet. Winter residence away from high cold winds, if it can be afforded. A long vacation once or twice a year is also helpful.

Sweat baths or Turkish baths if well borne.

Reduction of blood-pressure to be attempted only with extreme caution.

3. Patients with hypertension and outspoken myocardial insufficiency. These require all those general rules of the second group, and, in addition, symptomatic treatment for dyspnea, edema, and chronic passive congestion of the viscera. Some of the cases have anginoid pain or severe angina on exertion. Physical exertion must be very mild. To ward off anginal attacks, nitroglycerin tablets may be carried and dissolved on the tongue. Theobromine may be useful.

During heart failure rest in bed is necessary, or if orthopneic, in a chair. If auricular fibrillation comes on, digitalis effect should be secured. Digitalis will also help the edema and dyspnea if carefully given. The diet must be carefully regulated. The output of salt, nitrogen and fluid must be carefully worked out on a known intake. The Mosenthal test-meal will be most helpful and the phthalein test will aid. The blood urea and Ambard's coefficient will be of great help to determine the nitrogen retention. If nitrogen retention is found, protein intake must be strictly limited. A good low protein diet is that of Mosenthal:

Breakfast.—Sherry, 30 Cc.; baked apple, stewed prunes, or orange; hominy, cornstarch, cereal (⅔ hominy, ⅓ cornstarch, cream 15 Cc.).

Dinner.—Sherry, 30 Cc.; potato, baked, mashed; string-beans, carrots, lettuce, onions, tomatoes, or cucumber pickles; fruit, corn-starch pudding, or fruit tapioca pudding.

Supper.—Same as dinner. Sugar and

butter may be taken as desired and need not be weighed.

The salt intake, if salt is retained, should be cut to a point below the twenty-four-hour output. When there is much edema, salt-free or salt-poor diet should be given. The Karell diet is ideal in these cases. This consists of 800 Cc. of milk as the only food or fluid allowed. When diuresis becomes abundant the milk may be increased to 1500 Cc. All such patients must continue to take very little salt and not to take fluid or food in large quantities.

During a condition of improvement return to activity must be very gradual and must be carefully supervised. Safeguarding treatment must be rigid.

4. Patients with general edema without myocardial insufficiency, the prominent symptom. Albumin in large amount and containing casts.

This is the group called degenerative nephritis or nephrosis. It is not large. The blood-pressure is generally not raised. Autopsy may show amyloid disease. The functions of salt and water elimination are particularly disturbed. The phthalein test and tests for nitrogen retention may be normal.

The diet should be one of low salt and water intake to encourage elimination of water. If the edema disappears, water intake may be increased up to the point of output. Later the salt intake may be increased up to the point of excretion. Bed is desirable until function is restored. The further treatment is as in group 1. When the edema does not diminish on the above treatment sweating must be used.

5. Advanced renal insufficiency with uremia.

All the evidences of impaired kidney function are shown. The test diet would be too extreme for such a case. Water elimination may remain normal and no edema may develop. Treatment is symptomatic. For the dyspnea the patient may be kept in a chair. Sodium nitrite at bedtime with chloral or bromides or together may induce sleep. There is apt to be acidosis, and alkalies may be tried. Morphine may be given, but may lead to anuria and coma and must, therefore, be used carefully. The diet should be practically protein-free with a large amount of carbohydrates. An occasional nitrogen starvation day has proved useful to Janeway. Water should be given liberally if the excretion will care for it.

When uremia is present measures to eliminate the poisons must be used. Bleeding is very useful if there is not too much anemia. It is particularly useful when there are convulsions. At least 500 to 600 Cc. of blood should be removed in such cases. Sweating may also be useful. It is very important to treat the myocardial condition which is present. An attempt should be made to prevent or improve passive congestion.

If there is an obstruction to urinary flow, this should be removed. An enlarged prostate, pyelitis, or pyelonephritis may rapidly lead to severe kidney damage. Decapsulation of the kidneys may be indicated, especially for the severe edema or acute anuria or oliguria cases. Such an operation may do much to prolong life.

INDIGESTION IN CHILDHOOD.

In the *Journal of the American Medical Association* of July 10, 1920, Morse, in referring to treatment, states that there is no place for the so-called digestants in the treatment of chronic indigestion in childhood. There is probably never an insufficiency of either hydrochloric acid or pepsin, and, as pancreatin is destroyed in the stomach, it cannot possibly be of any use. Treatment, therefore, consists primarily in regulation of the diet to fit the digestive capacity of the individual child. The element or elements of which it cannot take care must be cut down to the point where it can take care of them. This point can be determined only by the examination of the stools. The deficiency in calories, brought about by the cutting down of the amount of one or more of the food elements, must be made up by increasing the amount of the others. The amount of the

element that is causing the trouble must be increased as fast as the increasing tolerance will allow. It is not enough in severe cases of chronic indigestion, due to intolerance of one or more of the food elements, to give general directions as to the diet. The diet must be laid out explicitly, and the number of grammes of the offending food element allowable daily must be definitely stated. The number of calories which the child needs must also be indicated. A list showing the caloric value and the content in grammes of the various food elements in the foods allowed must be given to the parents and its use explained. In his experience, almost all parents are intelligent enough to use these tables. He has had no difficulty in getting their interest and coöperation.

In the cases in which there are marked clinical evidences of fermentation, bacteria undoubtedly play an important part in the production of the symptoms. They unquestionably also play a part in the cases in which the evidences of fermentation are less marked, because bacterial fermentation is always going on in the contents of the gastrointestinal tract under both normal and diseased conditions. What proportion of the symptoms in a given case is due to bacterial fermentation and what proportion to disturbance of the chemical processes of digestion is, however, almost impossible to determine. It is impossible, moreover, to know whether the trouble was originally due to bacteria or to disturbance of the chemical processes of digestion. In general, however, it is probable that the difficulty was not originally due to bacteria, as it is impossible to implant permanently any organisms in the intestine by giving them in the food. Fortunately, it is not important to know which is primary, because the two factors are finally active in every case.

Whether primary or not, however, abnormal bacterial activity must be stopped. It is impossible permanently to change the intestinal bacterial flora by giving bacteria by the mouth, although the flora may be temporarily somewhat modified, if the bacteria are given continuously. The intestinal flora can be changed by changing the composition of the food—that is, the flora may be changed from the acidophilic to the putrefactive by changing the composition of the food, and *vice versa*. Cutting down the proportion of the carbohydrates and increasing that of the protein in the food changes the flora from fermentative to putrefactive, and cutting down the proportion of protein and raising that of the carbohydrates changes it from putrefactive to fermentative. This can be proved by bacteriologic examination of the stools, but is shown equally well by the change in the reaction of the stools, the stools being acid when the bacterial flora is mainly fermentative, and alkaline when it is mainly putrefactive. Organisms growing on fat have relatively little to do with fermentation in the intestinal tract, but the products of their activity increase the acidity of the stools. Treatment by regulation of the diet on the indications furnished by the examination of the stools thus not only aids the weakened digestive powers but also changes the bacterial flora.

When the organisms of the gas bacillus group are the cause of the fermentation in the intestinal contents, something may also be done to limit their activity by the administration of organisms that produce lactic acid. The best type for this purpose is probably *Bacillus bulgaricus*. It is more effective when given in the form of buttermilk than in tablets or cultures, because it is numbers that count, and there are infinitely more organisms in buttermilk than in any tablets or little tubes of cultures. Furthermore, the buttermilk contains considerable amounts of lactic acid, which is of itself inimical to the growth of the gas bacillus and putrefactive organisms. The lactic-acid-forming organisms are also sometimes of benefit in the treatment of putrefactive conditions. It must be remembered, however, that the lactic-acid organisms cannot change the bacterial flora permanently. This can be done only by so changing the diet as to change the character of the culture medium in the intestine. It

is doubtful whether the growth of other pathogenic organisms can be influenced by the administration of any other organisms in the food.

There is no place for drugs, except for the temporary relief of symptoms, in the treatment of chronic indigestion in childhood. Cure can be brought about only by regulation of the life and diet. In severe cases the most minute attention to every detail is absolutely essential. In these cases recovery is a matter of many months, and often of years, while relapses are frequent. Recovery is, however, almost always possible, provided the treatment is careful enough and is kept up for a sufficiently long time.

POST-SALVARSAN JAUNDICE.

HALLAM, in the *Lancet* of June 26, 1920, in summarizing his article on this subject, states:

1. That a considerable number of patients suffer from jaundice following the injection of "606."

2. That it occurs relatively more frequently after the 914 group of arsenobenzol preparations (neosalvarsan, neokharsivan, novarsenobillon, etc.).

3. That it may occur in epidemic form.

4. That the causation is as yet undetermined.

TRANSFUSION OF BLOOD IN HEMORRHAGE.

GRAHAM (*Edinburgh Medical Journal*, March, 1920) notes that Bayliss has pointed out that a diluted blood at moderate pressure is much more efficient for maintaining the vitality of the tissues and organs than a concentrated blood at low pressure.

It is important, therefore, in all cases where the patient is reduced to a dangerous condition by loss of blood, to increase the amount of fluid circulating in the vessels.

Clinically the important signs of benefit following transfusion are improvement of the patient's color, completely restored mentality, slowing and regularity of the pulse, and rise in blood-pressure. Respirations also become regular, and hemoglobin at once attains a higher percentage and the corpuscular count is increased.

The great advantages of blood transfusion compared with infusion of normal saline or other artificial solutions are: The blood-pressure is immediately raised; the blood-pressure is likely to be maintained; the oxygen-carrying capacity of the blood is increased.

In recent cases of hemorrhage hemoglobin estimations and blood counts are not of much assistance. The best indication for transfusion is the presence of signs of serious collapse, such as pallor, subnormal temperature, a small, fast pulse with low blood-pressure, restlessness, sighing and rapid respirations, syncope or other symptoms of deficient oxygenation. The syncope and collapse which follow a sudden profuse hemorrhage frequently yield rapidly to simple measures, such as raising the foot of the bed and administering fluids; the pulse may be imperceptible only for a few minutes, and quickly recovers its tone and quality. If each case is considered on its own merits, transfusion will not be employed unnecessarily. In doubtful cases the blood-pressure is the most valuable index of the gravity of the case. Continuance of collapse and a rapidly falling blood-pressure, when the hemorrhage is controlled, are signs of serious significance, and strongly suggest the necessity for transfusion, particularly when saline infusions and other measures have been tried.

According to Bruce Robertson, the patient's condition is precarious if the blood-pressure is below 70 mm., and when it is below 90 mm. the patient is a bad subject for operation. The writer's own observations confirm these views regarding the significance and dangers of low blood-pressure in cases of hemorrhage. Graham recites a number of clinical cases illustrating the life-saving value of transfusion.

Apart from shock, patients suffering from sepsis are less likely to recover quickly from loss of blood than when the effects of septic poisoning are absent. Repeated hem-

orrhages are liable to hasten the patient's death. Lowered vitality from loss of blood prevents the sepsis from being overcome, and the toxic condition maintains the anemia. Such patients often require operation, and, therefore, occasions must frequently arise when transfusion of blood is called for. In reanimating patients suffering from secondary hemorrhage, transfusion yields as striking results as in cases of primary hemorrhage.

Transfusion of blood is the method of choice in cases of hemophilia if the symptoms are alarming, or if the bleeding continues in spite of other methods of treatment.

The advantage of transfusion is that it not only controls bleeding, but replaces the blood which has been lost, and therefore improves immediately the patient's general condition.

The effect of transfusion in arresting bleeding in the case of hemorrhagic disease of the new-born is as striking as that which follows transfusion in hemophilia. The mortality from melæna neonatorum and other forms of bleeding in the new-born is, unfortunately, high; and in these conditions there is apparently delay in coagulation.

The intravenous injection of 50 to 100 Cc. of whole blood by means of syringes is so simple in infants that there is no object in delaying transfusion in critical cases, which will include the majority, once the diagnosis has been established. In less serious cases transfusion should not be delayed for more than an hour or two, if it is evident that subcutaneous injection of blood or of serum has failed to arrest the bleeding.

A sufficient number of cases of purpura hemorrhagica, treated by transfusion on account of the anemia, have been recorded to show that in a considerable proportion the tendency to hemorrhage is arrested at least temporarily.

It has been suggested that the hemostatic effect of transfusion may be due to the introduction of fresh blood platelets which are known to be reduced, especially during or after a period when hemorrhages have occurred.

In cases of internal hemorrhage in which the bleeding point is not controlled, as in hemorrhage from the stomach or duodenum, it would naturally be concluded that the effect of raising the blood-pressure by transfusion would be to increase the hemorrhage, and that the blood which was introduced would quickly be lost again. There is a good deal of clinical evidence to prove that this effect of transfusion need not be greatly feared.

Graham's conclusions to an excellent paper are as follows:

Transfusion is frequently life-saving, when other treatment for the constitutional effects of hemorrhage has failed.

It diminishes the amount of shock during operations of exsanguinated cases.

It has a restorative effect in cases suffering from the combined effects of hemorrhage and shock, either traumatic or operative, when other treatment has failed. It can raise and maintain the blood-pressure, and restore patients suffering from severe shock, when other treatment for shock has failed.

It is less effective in cases of pure shock than in cases of hemorrhage. The immediate response to transfusion is as pronounced in cases of secondary hemorrhage as in primary hemorrage. Transfusion may improve the patient's resistance to infection, and indirectly hasten healing of septic wounds.

Transfusion has a specific action in hemorrhagic disease of the newly-born, arresting the hemorrhage and permanently restoring the patient to health. Transfusion has a specific action in hemophilia, and is the most certain means of arresting bleeding in this disease. Immunity against recurrence of hemorrhage is conferred for a variable time.

Transfusion may temporarily diminish the tendency to hemorrhage in cases of purpura hemorrhagica, but there is little evidence that it can materially alter the course of the disease. Transfusion will, in certain cases of secondary anemia, asso-

ciated with repeated small bleedings, favor the natural arrest of hemorrhage.

Transfusion may save life in cases of uncontrolled gastric or duodenal hemorrhage, and in such cases encourages the arrest of bleeding by improving the quality of the clot.

When the bleeding has ceased spontaneously, the transfusion of a moderate amount of blood is unlikely to excite fresh hemorrhage. The local treatment of septic wounds is the most important factor in preventing a recurrence of secondary hemorrhage, and transfusion can only indirectly diminish the risk of bleeding.

CONGENITAL OBSTRUCTION OF THE POSTERIOR URETHRA.

YOUNG, FRONTZ and BALDWIN (*Transactions of the American Association of Genito-Urinary Surgeons,* Volume XII, 1919) detail a clinical study of cases which they summarize as follows:

A review of the literature has revealed twenty-four authenticated cases of congenital obstruction of the posterior urethra; while in the last six years there have been admitted to the Johns Hopkins Hospital twelve cases showing this condition. It is therefore considerably more frequent than would be inferred from the attention given it in the past.

Autopsy studies have shown that there are three distinct types of congenital obstruction, all more or less valvular in construction, so placed that the concave surface of the valve is directed upward, thus bringing about an obstruction to the outflow of urine. In the great majority of cases symptoms of the condition are manifest during infancy or early childhood.

Symptoms of the condition are those arising from obstruction to the outflow of urine together with the symptoms resulting from renal destruction, induced by back pressure and infection.

The history of symptoms of urinary obstruction in male children should always suggest the possibility of this condition. The presence of a distended bladder and particularly of residual urine is further indicative of obstruction. This possibility is further strengthened by obstruction in the posterior urethra to the passage of a catheter. Much information regarding the character and exact location of the valves and the renal damage resulting therefrom may be obtained by urethroscopy, the *x*-ray, and renal function studies.

The treatment of the condition is surgical and consists of the removal of the obstruction. This may be accomplished in certain cases by the passage of a sound with the forcible rupture of the valve; in certain other cases the obstruction may be removed by the urethrotome or by urethroscopic methods.

Of the operative procedures the selection of the suprapubic or perineal route will be governed by the personal preferences of the operator. In infants and young children the suprapubic method has proved very satisfactory, the valvular obstruction being removed by its forcible rupture with a sound, its division with a rongeur, or its removal by scissors or cautery. In adults the condition is treated in most cases by intra-urethral methods.

THE TREATMENT OF SYPHILIS BY THE ANTISYPHILITIC SERUM OF QUERY.

DOBRIANSKY, SEQUEIRA and THOMPSON (*Lancet,* April 24, 1920) state that the value of mercurial preparations in the treatment of syphilis is undoubted, but their action is limited to certain stages in the course of the disease. The utility of mercury in the later manifestations of syphilis of the nervous system, such as tabes dorsalis and dementia paralytica, is very slight; not only does it fail to retard the progress of these diseases except in the very slightest degree, but it also fails even to give relief to the more obvious and distressing symptoms, such as lightning pains, progressive optic atrophy, or ataxia.

Salvarsan and its various preparations have, in their hands, been equally ineffective. While in the early stages of

syphilitic infection salvarsan has a markedly destructive action on the syphilitic virus, it often fails entirely to prevent relapses, and later involvement of the nervous system is only too frequent. Not only are the later nervous manifestations of syphilis resistant to mercury, salvarsan, and the iodides, but certain gummatous ulcerations of the skin are equally unaffected, and may be treated for months without benefit by the usual remedies.

In view of the remarkable results reported from France of treatment of syphilis by Dr. Query's serum, a trial of it was made in the dermatological department, and, in cases of nervous diseases, at the London Hospital. Dr. Query states that his serum is prepared by inoculating monkeys with the filtered cultures of the organism of syphilis grown on bouillon. When the serum of the monkeys gives a strong positive Wassermann the animals are bled and the serum is collected and preserved in ampoules. Metchnikoff and Neisser had attempted to prepare an antisyphilitic serum by inoculating monkeys with the culture of Schaudinn's spirochetæ, but Query used the toxin prepared from filtered broth cultures.

The authors note that of three cases reported, all in the tertiary stage, all resistant to the recognized methods of treatment, the symptoms were relieved with astonishing promptness.

The first case was a gummatous ulcer of the leg, of long standing, with hyperkeratosis and deafness. Arsenic was used without benefit. In all 4.5 grammes of arsenobenzol were injected. The ulcer in the meantime received proper surgical treatment. Mercury and iodides were also futile.

This patient received 20 injections of serum in fourteen days, as the result of which her ulcer promptly healed and she regained her hearing.

The second case is one of tabes dorsalis with pronounced ataxic symptoms. Five intrathecal and 20 hypodermic injections of Query's serum were given. The ataxic symptoms had in the main disappeared.

The third case was one of ataxia with intractable lightning pains, for the relief of which the patient took 35 grains of pyramidon a day. After seven injections she was so greatly relieved of pain that she discontinued this drug and her general condition greatly improved.

This meager report of cases, not too well observed or recorded, is not convincing.

VAGINAL DRAINAGE.

PLONIKE (*Minnesota Medicine*, May, 1920) observes that in order to emphasize the advantages of draining through the vagina, one need only refer to some of the drawbacks of drainage from above. They are: a long, tedious convalescence, a nasty discharging wound, a possible permanent fistula, an unsightly scar, and a weakened abdominal wall with its danger of postoperative hernia.

On account of these objections the writer has for a number of years past substituted vaginal for abdominal drainage whenever possible. Not alone in pelvic abscess and other pathologic conditions that can be relieved by opening the cul-de-sac from below, but also in those cases in which an abdominal operation with drainage of the pelvis and lower abdomen is required. Every surgeon is familiar with the method of puncturing the vaginal wall to evacuate the cul-de-sac. Drainage through the vagina by placing the tube from above has been satisfactory, both for immediate effects and end results.

His method is as follows: When careful examination reveals a condition that suggests a probable necessity for drainage, the patient after being anesthetized is placed in the lithotomy position, a weight speculum introduced, and the vagina swabbed dry with a sponge; tincture of iodine is then applied to the vaginal wall and cervix; the posterior lip of the cervix is grasped with a tenaculum forceps and drawn forward. A fold of mucosa about half an inch posterior to its junction with the cervix is grasped with a long, curved, rat-toothed forceps, with the point directed forward.

The forceps is left in this position. When the hand releases the forceps it will rotate one-fourth to one-half way round. It is important to note which way it turns so as to instruct the nurse how to manipulate it later. The speculum is removed and the patient placed on the table, the parts prepared, and the abdomen opened in the usual way. If during the operation the peritoneum becomes soiled, or for other reasons drainage is decided upon, the uterus is grasped with a uterine elevator, and pulled forward and upward. A nurse or other attendant, who need not be a "clean," passes her hand under the cover from below, grasps the handle of the forceps and brings it in position so the point is directed forward. With force from below the point of the forceps is plunged through the vaginal wall until it emerges in the cul-de-sac; it is guided by the hand of the surgeon, which may be covered by gauze or towel protecting the viscera above. The blades of the forceps are separated, thereby enlarging the opening. If deemed advisable the opening can be further enlarged by stretching with the fingers from above. If preferred the opening in the vaginal wall can be made from above with sharp pointed, curved scissors, using the point of the forceps in the vagina as a guide. The end of a good-sized rubber tube and one or two strips of iodoform gauze are placed between the open blades of the forceps. The forceps is closed, and holding the tube and gauze is withdrawn through the vagina. The upper end of the tube, which is allowed to extend about two inches into the cul-de-sac, is fastened loosely to the posterior surface of the uterus with one stitch of plain catgut. The gauze is used to keep the wound open, to control oozing, and prevent adhesions between the intestines and denuded surfaces. The omentum is pulled down and the lower end carefully tucked in between the uterus and intestines. This is important, for it thus provides an avenue of escape for the infected secretions higher up, guiding them to the drain in the most dependent part. As the success of any drain depends largely on the reversal of the lymph circulation, which latter is stimulated by irritation, such as caused by trauma or foreign material, it is obvious that if the omnetum, with its rich lymph supply, is brought in contact with the injured part, or still better the drain itself, it will aid materially in producing the desired results.

THE VALUE OF DRY, WET, AND OINTMENT DRESSINGS FOR WOUNDS.

SOUTHER (*Ohio State Medical Journal*, May, 1920) says that the dry gauze dressings are ideal for clean surgical cases of almost all types. Many good surgeons use dry dressings almost exclusively. They form a protection from infections and will absorb discharges of all kinds, but in the author's judgment are not indicated in wounds in which infection is liable to develop on account of the circumstances and conditions prevailing at the time of accident or injury. Dry gauze dressings may well be used in wounds in which suppuration is already established, and more especially when the wound is into or connected with any of the serous-lined cavities. However, when mucous-lined cavities are involved avoidance of irritation and greater dressing efficiency will be obtained from some form of ointment dressing, preferably with a heavy mineral base.

Wet dressings are indicated in the presence of cellulitis or when there is much edema in and about the wound. Moisture helps to reduce the swelling of the parts by a reduction of the temperature, and when sodium chloride, aluminum acetate or other salts are added to the moist dressings their effectiveness is very materially increased, especially if the wet dressings are large and are never allowed to get dry, thus maintaining both hygroscopic action and a certain amount of dialysis. The water-bath, when it can be used, gives better and quicker results in controlling infection than any other method.

The use of Dakin's solution may be

classed as a wet dressing, but its action should be strictly limited to the wound area; it should not be allowed to come in contact with the skin. After seeing Dakin's solution used in thousands of cases in France the writer says that its results quite came up to his expectations. It was invaluable for removing necrotic tissue and for ridding the wound area of pathogenic bacteria for earlier closure. When the use of the Carrel-Dakin method is carefully checked up by laboratory supervision it may do a lot of good, but its indiscriminate and improper use has resulted in definite damage to many cases. When used too strong it is capable of eating away exposed tendons which might otherwise have been saved by an earlier closure, even though primary healing did not result.

There is no doubt in the author's mind that the heavy vaselin gauze protection to the edges of the wound and the normal skin in the Carrel-Dakin technique does a lot to help these wounds heal. The Carrel-Dakin type of wet dressing should be used only until debridement of the wound is well under way and the bacterial count is from 5 to 10 organisms to the field. Instructions were published in the A. E. F. Bulletin advising that the hot saline solution be substituted for Dakin's solution where cellulitis and peri-wound infections develop.

It is always best to remove any foreign body in the wound first, then to use Dakin's solution to remove necrotic débris, and sterilize the wound as rapidly as possible for early closure to avoid doing any damage to normal tissue. Dakin's solution was the cause of secondary hemorrhage in many cases in which vessels were exposed to its long-continued action.

Wet dressings are contraindicated in outpatient clinical work in cold weather because of the danger of freezing. Bichloride of mercury does harm unless used in solutions as weak as 1 to 10,000. Carbolic acid is extremely dangerous even when used in very weak solutions. Boric acid, acetate of aluminum and sodium chloride solutions deserve the most consideration, as they are the most efficacious as wet dressings or in the form of baths for all sorts of wounds even when complicated by cellulitis.

Practically all cases of accidental wounds may be dressed with ointments whether they are to be closed or left open. This also includes fistulæ, sinuses, boils, abscesses, and mastoid cases that are draining. Almost all of the recent cases at Evacuation Hospital No. 12, St. Mihiel Sector, were dressed with vaselin gauze in and over the wound, with the exception of those of the scalp, joints, and chest.

Ointment should be used in dressing because it facilitates drainage. It protects the surrounding skin from the development of dermatitis or eczema. It prevents albuminous exudate from getting dry and sealing a wound and stopping drainage.

It prevents infectious material from being absorbed because the wound is never sealed. Accidental hand and foot injuries seldom have any swelling when dressed with ointments, due to better drainage and keeping the wound moist and preventing sealing up. There is no pain on changing ointment dressings nor any pull on stitches, and it takes a very short time for renewing the dressing. Epithelium grows faster under an ointment dressing. Ointment dressings need not be changed any more frequently than dry dressings, usually not as often.

The author states that he has used an ointment dressing in almost all industrial accident cases for some six years past and much prefers it to any other. This includes amputations and all other cases in which the wounds are soiled and in which some degree of infection is bound to be present or at least delay union. In prewar times a complete debridement was seldom done in these cases.

War experience has taught all the value of an immunizing and prophylactic dose of antitetanus and streptococcic serums, in all cases of compound fracture.

Given a bad hand injury with crushed and lacerated fingers, the following method of handling has given very good results:

Control hemorrhage. It must be emphasized that all instruments and dressings used throughout the procedure must be sterile. Obtund the parts by the application of local or regional use of local anesthesia. If pain that will prevent proper handling of the wound cannot be otherwise controlled general anesthesia must be used, although local anesthesia suffices in almost all cases.

Wait at least ten minutes for the local anesthesia to become effective.

Cleanse the wound and surrounding parts thoroughly with benzine and iodine.

Remove with a scissors any dead or hopeless tissue.

Repair tendons carefully with chromic catgut No. 0 and suture all structures back in place as well as may be possible with interrupted sutures. Absorbable sutures should be used internally, especially when they are to be buried. Non-absorbable sutures are preferably used externally. Reapply tincture of iodine. Dress with an ointment dressing to be removed within forty-eight hours.

Thus handled even bad cases will rarely show any swelling at the first dressing unless the circulation has been injured. The dressing may be much soiled on account of more than the usual amount of discharge. Cleanse the wound gently with benzine, gasoline, or peroxide, and reapply ointment dressing. Repeat dressings every forty-eight hours up to a reasonable time for fair healing, and then apply twenty-per-cent silver to areas not healed and dress dry; changing the dry dressing every two to four days.

Ointments with a mineral fat base are preferable. Of the paraffin group the heavy, red, cheaper petroleum jelly is best. The white refined vaselin is a poor vehicle because it is more volatile and not as protective to the skin. The author found it absolutely inadequate as a protection to the skin in the use of Dakin's solution.

To the petroleum base may be added one or more of a number of antiseptics or antiparasiticides — yellow oxide of mercury, crude coal tar, calomel, and ichthyol, all in one-per-cent strength; or one-fourth per cent salicylic acid, two per cent boric acid, or zinc oxide, all of which have some antiseptic properties. The efficacy attained by bismuth paste and the principles involved in its use speak well for the merits of ointment dressings.

The animal fats are less desirable because they are absorbed by the tissues and tend to let the dressings dry out. Lanolin is the only one worthy of consideration, and in so much as it costs more and is worth less it may be discarded for the purpose in question.

Years of experience have made the writer a convert to some of the dermatological teachings of the older writers and to the value of ointments in dressing wounds.

SURGERY OF THE KIDNEY.

JUDD (*Minnesota Medicine*, May, 1920) contributes an excellent clinical article on this subject and calls attention to the necessity, from a diagnostic standpoint, of recognizing pelvic kidneys. This condition differs from floating or movable kidney in that the renal vessels may arise from the common or internal iliac vessels, and the pedicle of the kidney may be short so that it is more or less fixed in the pelvis. A pelvic kidney may be normal in functionating capacity and cause no trouble, or it may be afflicted with any of the pathologic conditions which arise in a normal kidney. Several times a right-side infected ectopic kidney has been approached on the presumption that the condition was an appendiceal abscess. It seems advisable to have a pyelogram made in all the uncertain cases of pelvic tumor in which an ectopic kidney may be the tumor. In a series of 19 cases of pelvic kidney previously reported, 9 of the patients required operation because the kidney was pathologic. In the other 10 cases the kidney was apparently functionating normally.

The movable and the floating kidney have ceased to occupy an important place in surgery. At one time the surgeon considered it advisable to fix in the normal position all kidneys that seemed to lie too low or to be too movable, but at the present time the mere position of these kidneys is not deemed an indication for operative treatment. Usually, this condition of general visceroptosis is associated with the syndrome of general neurasthenia and will not be benefited by surgery. Undoubtedly at times the floating kidney assumes a position which causes a change in the position of the ureter, so that the flow of the urine is obstructed and an intermittent hydronephrosis, which can be determined by a special examination, results. In such cases surgical treatment is usually advised, although it does not always obtain the best results. Occasionally it may seem advisable to fix a floating kidney to relieve symptoms produced by its abnormal position; but more often interference with function is the factor which decides whether or not operation should be done.

If the escape of the urine from the kidney is suddenly and completely arrested by ligation of the ureter, the organ ceases to secrete, and finally undergoes atrophy. It might be expected that an unfavorable prognosis would follow ligation of the ureter and that eventually the kidney would have to be removed, but in not a single case of the many instances in which he has been obliged to ligate the ureter has a demonstrable hydronephrosis developed, and in no instance has it been necessary to remove the kidney. Experimental work on animals and Caulk's operative work on man have demonstrated that if the ureter is liberated after it has been ligated completely and has remained closed for as long as fourteen days, the kidney tissue will gradually recover and functionate normally. Hydronephrosis, then, will not result from the ligation of the ureter, but it may, and usually does, result from hindrance to the flow of urine during a long period. The altered position of the kidney or the pressure of an anomalous vessel on the ureter may eventually result in a hydronephrosis. At first the hydronephrosis will be intermittent; later, after changes have occurred in the kidney tissue, especially in the pelvis, the hydronephrosis will become permanent. A small hydronephrosis, with some dilatation of the calyces, is not uncommon and may exist without producing symptoms. In view of the fact that surgery is not always satisfactory in these cases, it seems best not to be too urgent in advising it. If an anomalous vessel is the cause, the condition will be relieved by the division of this vessel, provided the hydronephrotic sac is not too large. If the cause of the condition is a stricture or an angling of the ureter a plastic operation at this point of the ureter would seem to be indicated. A number of these plastic operations have been done in the clinic in cases in which hydronephrosis was sufficient to produce marked symptoms and yet had not resulted in any destruction of the kidney. The results in these cases have not been generally satisfactory. Some patients have had recurring trouble which required nephrectomy. The operation described by Peck, "splinting the ureter," has proved very satisfactory in some cases. If the hydronephrotic sac is large and the calices markedly dilated, it will be best to resort to a nephrectomy if the other kidney has been found to be normal.

Pyogenic infections of the kidney are common, and in most instances surgical treatment is indicated. If the infection takes the form of a pyelitis or a pyelonephritis, however, both kidneys are usually involved, and little can be accomplished by surgery. A common type of infection in the kidney occurs from several days to several weeks following attacks such as of tonsillitis and boils. The kidney receives the organism through the blood stream and the involvement occurs in the form of a single abscess or, more often, multiple cortical abscesses. This is indicated by chills, a rise in temperature, and a high leucocyte

count, and usually by much local pain and tenderness, especially if the infection extends into the perinephritic space. A large perinephritic abscess sometimes forms, drainage of which is frequently sufficient. If multiple abscesses are found in the cortex with considerable destruction of the kidney substance, a nephrectomy is indicated.

Tuberculosis of the kidney is a common finding. In every instance in the author's cases in which tuberculosis bacilli were found in the urine coming from the ureter, a definite tuberculous process was demonstrated in the kidney. It is of the greatest importance to recognize the condition while the process is confined to a single kidney. When only one kidney is involved, the ultimate results of its removal will be very good, but if the condition has reached the other kidney, no form of treatment is effective. Under ordinary circumstances, if one kidney is extensively involved and the other only slightly, the one showing greatest destruction should be removed unless there is evidence that the disease is general.

In the technique of the removal of a tuberculous kidney, the perirenal fat must be removed completely and the cut end of the ureter isolated, or the entire wound may become infected and tuberculous with very serious results. Tubercles are found in the tissues of the ureter, and in many cases in the bladder. Removal of the entire ureter has been advocated, but this adds greatly to the extent of the wound and does not accomplish its purpose, as a ureter cut off at the bladder offers the same opportunity for soiling as it does when cut off at the kidney pelvis. To prevent infection from the cut end of the ureter, W. J. Mayo devised the plan of suturing the end of the ureter to the skin so that it prolapses out of the wound. Sometimes it is difficult to free the stiff ureter sufficiently to get it entirely out of the wound. If this cannot be done the end of the ureter is freed for several inches and the ligated end is threaded into a rubber tube, which is allowed to project from the wound for at least six days. In this manner, any soiling from the cut end of the ureter is carried to the outside by the tube and is not poured into the perirenal tissues. The results following these procedures of isolating the ureter after nephrectomy for tuberculosis of the kidney indicate their great importance.

A study of renal tumors shows benign tumors of the kidney to be very rare. Solitary cysts that may be enucleated from the kidney are sometimes seen. Congenital, bilateral polycystic disease is more common, but it is not particularly amenable to surgical treatment. Patients are usually very anemic and have a low kidney function. If one of the cystic kidneys is also infected and the other is free from infection, it is sometimes advisable to remove the infected organ. Experience with the Rovsing operation, which consists in collapsing the cysts in first one kidney and then the other, has not been entirely satisfactory.

The common tumors of the kidney are malignant, either hypernephroma or carcinoma in the adult, or sarcoma in children. The results of nephrectomy for hypernephroma have been more permanent than those of most operations for malignancy. The tumor develops slowly, and if operated on before it becomes fixed by attachments formed from extension, especially through the pedicle and extensive lymphatic involvement, the results are very satisfactory. If the tumor is large and fixed no operation should be attempted, and it may be well to use radium. Some patients with inoperable tumors who otherwise were in fair condition have seemed to do very well under this treatment. Operations for carcinoma, and for sarcoma of the kidney in children, are less favorable; while a very large tumor may be removed successfully it will usually recur early.

Judd calls attention to the incision which he has found most useful in exposing the kidney. This was described by Dr. W. J. Mayo some years ago. It combines the advantages of the so-called posterior and anterior incisions, adding materially to the facility with which these operations may

be performed. It is crescentic, beginning well forward on the flank above the spine of the pubic bone, extending backward and upward to the point of articulation between the last rib and the vertebræ. The incision must extend far enough forward to give a good exposure of the pedicle in cases in which the pedicle is short and the kidney high-lying. The operation is extraperitoneal throughout. The important sensory nerves come into view readily and are preserved. In some instances it is necessary to cut through the back muscles. The perirenal fat should be extensively removed in all tuberculous and malignant cases. The cut-off end of the ureter should be isolated in all tuberculous cases, in such a manner that it will not soil the wound. This may be accomplished by fastening the ureter outside the wound or isolating it by threading it through a rubber tube. The pedicle, consisting of the renal vessels, should be caught by two clamps. When tying the pedicle, the deeper of the two clamps is released while the ligature is being tightened onto the pedicle; in this way the pedicle is controlled by the ligature and also by the second clamp. Another ligature is then placed on the pedicle before the second clamp is removed.

The points to be emphasized in operations for the removal of stone from the kidney are, first, exposure of the kidney by displacing it from the wound; second, careful exploration of the kidney pelvis and calcyces with the finger in order to avoid overlooking any stones; and third, closure of the incision in the kidney pelvis in non-infected cases.

Of the 239 patients on whom nephrectomy was done 7 (2.9 per cent) died. Three had tuberculosis of the kidney; one died of tuberculous bronchopneumonia; one of miliary tuberculosis of the lungs and tuberculous peritonitis; and one of chronic nephritis and bilateral pleuritis. Two of the patients had pyonephrosis; one died of hemorrhage (forceps on pedicle) and one of thrombophlebitis of the inferior vena cava, the common, internal and external iliac veins. One patient with hypernephroma died of an infection. This patient was operated on by the transperitoneal route. One patient with carcinoma of the kidney died of acute nephritis and metastatic carcinoma in the lungs.

SURGICAL CORRECTION OF THE AQUILINE OR HUMP NOSE.

OPPENHEIMER (*American Journal of Surgery*, May, 1920) thus describes his operation: The tip of the nose is elevated, and with a small scalpel a short semicircular incision is made in the anterolateral portion of the nasal vestibule, just below the point of junction of the lateral cartilages with the nasal bone. Through this incision small blunt-pointed scissors or blunt dissectors of the Freer type are introduced between the nasal bone and the overlying integument, and the skin over the dorsum of the nose is thoroughly undermined, the extent of the undermining being, of course, determined largely by the size of the hump to be removed—care being taken to avoid puncture of the skin during this undermining process. Where the hump is moderate in size, undermining may be satisfactorily accomplished through incision in one vestibule, usually the left, but where conditions require it a similar intranasal incision may be made through the other vestibule, and through this the process of undermining is completed.

A small saw, scissors or rasp is introduced through the incision made, and the hump removed therewith. Usually the rasp will be found very satisfactory, and with a forward and downward motion (paralleling the nasal ridge) the anterior borders of the nasal bones are trimmed down until the hump is obliterated to a sufficient degree. Where the base from which the hump is removed appears to be very broad and sharp, the edges may be rasped off or shaved down with a small chisel. There is usually little bleeding, and oozing of any extent may be controlled by local applications of thromboplastin on cotton, after

which rubber tissue drainage strips are inserted through the primary intranasal incisions and carried well up on the dorsum of the nose. These drainage strips should be allowed to remain *in situ* for three or four days, or longer if deemed desirable. The nostrils are lightly packed with petrolatum gauze, or with bismuth-petrolatum gauze. Local inflammatory reaction may be checked by prompt institution of iced compresses, although in many cases it is remarkable how little local reaction is aroused. A splint of dental compound molded to fit the patient's nose, and held in place by adhesive straps, affords excellent protection against injury. The following day the nasal packing is removed, and the nose cleansed of clot and secretion with warm nasal douching. Inhalation of medicated steam vapor assists in the reduction of the swollen tissues. Under this treatment the nasal structures return to a normal appearance in a fairly short time, but the patient should be warned that it may be several months before all trace of inflammatory reaction and thickening of the tissues have disappeared, and the full benefit be obtained in a cosmetic sense. A photograph or plaster cast taken before and after the operation is advisable in all cases.

In cases in which the hump is so exaggerated that we have in addition an oversized nose with involvement of virtually the entire nose from the frontal notch to the tip, a more extensive undermining of the skin is necessary than where it is simply a question of removal of a hump. The undermining here should extend from the frontal eminence to the nasal tip, and also over the nasal processes of the superior maxillæ, where the nasal base is also to be narrowed.

In reduction of the height of the nose, after sufficiently extensive undermining, the nasal bones are sawed through from above downward, commencing at the frontal notch, and the required amount of bony dorsum removed. Next the cartilaginous portion is trimmed with the scalpel in a similar manner, the detached tissue being removed through the intranasal incision. Where an opening is made into the nasal chambers in this procedure, no ill effects appear to ensue, although some authorities caution against it.

After reduction of the height of the dorsum of nose, the length and width may appear increased, and the lobule brought into greater prominence than before. Where it appears desirable to produce a reduction in the width of the nasal base, this may be accomplished by sawing through the two nasal processes at their junction with the superior maxillæ, an elevator first separating the periosteum. The lower edges are then made to approach the middle line of the nose through pressure of the thumb and index-finger, and the nasal bones fractured at the nasofrontal junction. Where necessary to bring about a sufficient degree of mobility of the nasal process and nasal bones, they are seized with forceps such as the Adams or other similar instrument, one blade being inserted through the incision and the other in the nasal vestibule.

Tieck, on the basis of 1000 cases successfully treated during the past twelve years, notes that the deformities usually encountered are: The hook or bent nose, the saddle nose, the laterally deviated or bent nose, and the long nose. These deformities are usually inherited, although they may be due to trauma or disease. Lateral deviation is often due to trauma or deviated septum. Saddle nose may be due to syphilis. The author states that he has not yet attempted to use his methods in syphilitic cases. All the other above mentioned deformities are amenable to correction. A contraindication to the operation is infection in the accessory sinuses, Eustachian tube, or middle ear. Only healthy young or middle-aged people should be operated upon.

The operations are all performed under local anesthesia, for the same reasons that most other intranasal procedures are. Hemorrhage is diminished, and even if it occurs, there is no danger of aspiration of blood, as in the unconscious patient. With thorough infiltration the operation is absolutely painless, and practically bloodless. The operation is performed in the sitting posture, so that the patient can be of aid to

the surgeon by holding his head in any desired position.

Cocaine and adrenalin are used exclusively.

The operative procedure is divided into two stages: First, the exposure; second, the actual correction or reconstruction. The exposure is practically the same in all cases, although there may be slight variations from the type, depending on the nature of the deformity.

Four intranasal incisions are usually required in each nasal fossa, to obtain the necessary separation of skin and periosteum from bone. Occasionally only two or three may be necessary.

The first incision is made along the border of the pyriform opening of the nose. Beginning at the lower end of the nasal bone, it is carried downward and outward, through the mucous membrane and chondro-osseous junction. An elevator is passed through this incision, insinuated between the periosteum and the underlying nasal and maxillary bones, and swept laterally and mesially, lifting off the periosteum, subcutaneous tissue and skin from the bone. The entire area extending from the root of the nose, laterally over the nasal bones and superior maxillæ, is so liberated.

The second incision is made parallel to the bridge of the nose. Beginning at the lower end of the nasal bone, it is carried downward and forward, along the anterior edge of the bony and cartilaginous septum to the tip of the nose. This incision is carried through the cartilage, up to the perichondrium overlying the bridge of the nose. Then by careful dissection the perichondrium and soft tissues over the bridge of the nose and lateral cartilages are separated from the underlying bony and cartilaginous septum and the lateral cartilages, as well.

At this stage one should be able to sweep the elevator freely over the bridge of the nose, from roots to tip; and laterally well out over the cheeks, in the artificial space created between periosteum and bone and between perichondrium and cartilage. It is absolutely essential that this area be entirely freed in all operations, in order to attain uniform shrinkage, without formation of wrinkles or dimples, which would occur if at any point the overlying tissues remained in contact with the bone.

A third incision is made from one nostril to the other. Beginning at the end of the second incision (tip of the nose) it is carried backward along the lower border of the quadrilateral cartilage, to the nasal crest of the superior maxillary bone. This incision passes through mucous membrane and cartilage. A fourth incision is made through the lower lateral cartilage at the point where the cartilage bends upon itself. This incision divides the lower lateral cartilage into an external and internal half. The last two incisions are necessary to permit the requisite exposure for plastic work on the septum and cartilages.

Through the above-mentioned incisions every variety of nasal deformity can be corrected.

In the correction of the hook-shaped deformity, by means of a saw and rasp, the nasal bones at their junction with one another are pared down to the proper height, and the protruding bony and cartilaginous septum trimmed with a pair of scissors, the skin molded and placed into position. Should the nose appear too broad after the removal of the hump the remaining part of the nasal bones, together with the frontal processes of the maxillary bones, are forced over and bent inward into the desired position. In young subjects these bones are easily bent.

Shortening the nose is accomplished by resecting a triangular piece of cartilage, together with its perichondrium and mucous membrane, from the lower part of the quadrilateral cartilage. The base of the triangle is along the anterior border of the septum, its apex at the nasal crest of the superior maxillary bone. The lower part of the nose is then elevated, the edges of the wound brought together and sutured.

The tip of the nose is reduced by resecting a crescent-shaped piece of cartilage from the tip, on each side, and suturing the edges of the wound together. The alæ

nasi are reduced in size by resecting a crescent-shaped piece of cartilage from each wing and suturing the edges of the wound together.

Correction of lateral dislocation of the nose is accomplished by forcing the nose sidewise into the median line; the upper end of the anterior part of the bony septum, situated in front of and below the cribriform plate of the ethmoid, must be resected. This part of the septum, because of its wide base, is very strong and rigid. Any forcible side pressure thereon is very apt to cause a fracture of the cribriform plate of the ethmoid, with probable disastrous results; hence the extreme importance of resecting this anterior upper part of the septum before even attempting to force the nose into the median line. Having complied with this requisite the nasal bones, together with a part of the frontal processes of the superior maxillary bones, are dislocated by means of a chisel and saw and then forced into the median line. The forcible side pressure dislocates the frontonasal suture.

Correction of sagged-in bridge or saddle nose is obtained by elevating the nasal bone and filling in the defect with a transplant of the middle or inferior turbinate bone. By means of a chisel introduced into the nose the nasal bones are completely detached from the frontal process of the superior maxillary bones and from the nasal processes of the frontal bone, and then elevated sufficiently to raise the bridge of the nose to the desired level. Then the piece of middle turbinated bone, properly shaped and denuded of its mucous membrane, but not its periosteum, is placed between the anterior edge of the bony septum and the nasal bones. The graft is held in place by gauze inserted into each nasal cavity.

In two or three days the graft is firmly attached. Within three weeks the transplant has become hard and firm, by organization. In deeper depressions it is necessary to use the inferior turbinals. In milder cases the middle turbinate is large enough. These bones are admirably adapted for this purpose, on account of their vascularity, their convenient thickness, their ease of access during the intranasal operation. If the turbinal bone is not completely removed, the greater part of it will probably regenerate, and the resultant atrophy is very little.

In nearly all cases there is a certain amount of postoperative edema, and a mild periostitis, causing an apparent widening of the nose. This usually disappears in a short time under ice applications. But one may expect continuous improvement for six months. Out of one hundred transplants, only five broke down.

THE TREATMENT OF CRUSHED EXTREMITIES.

ESTES (*American Journal of Surgery*, March, 1920) speaks of the necessary means of controlling hemorrhage which though not immediately threatening customarily becomes so on the reaction. The general rule should be to place the tourniquet over the injured tissues above the severed vessels just as near the wound as it may be placed in order to be secure.

Since the bones are usually crushed select a splint not quite as wide as the diameter of the injured part, apply this alongside the limb, place sterile gauze over the injured area, and then apply the tourniquet over and around the splint and limb. The splint will prevent circular pressure over the whole periphery of the limb, but will allow sufficient pressure over the wound and severed vessels to prevent bleeding, without devitalizing constriction. No serious operative procedure should be undertaken if the systolic blood-pressure is below 80. He favors normal saline hypodermoclysis with the addition of epinephrin. He warns against the use of intravenous injection, except when done by a very skilful man. He has seen several patients hastened out of the world by intravenous saline injection. He is much impressed with proctoclysis by the drip method. When blood-pressure gets above 85 systolic the necessary operation may be attempted. Streptococcal and

staphylococcal infections are prevalent in injuries which occur in manufacturing establishments generally. Mines are remarkably free of infectious microörganisms except in the stables or in chambers where mules are fed and housed.

He states that, after the removal of all foreign matter and careful excision of the borders of the wound to its deepest part, adequate dependent drainage should be provided and the tissues should be brought into such coaptation that no dead spaces remain, or else the wound should be left freely open. Avoid tension in suturing.

Immunizing doses against tetanus are given when indicated. Comminuted wounds are especially adapted to the Carrel-Dakin treatment. Unless properly applied this is a delusion and a snare. Where infection develops, free incision and independent drainage are insisted upon. Estes' rules in regard to amputation are as follows:

When the soft tissues under the skin as well as the bone have been comminuted by a squeeze or pressure of a car wheel or heavy machinery, even though the skin may not be badly lacerated, an amputation will be required.

If the bone or bones of a limb be comminuted beyond a distance of 6 cm. and the soft tissues immediately about the bone be badly lacerated, one should amputate.

Extensive longitudinal and oblique lacerations admit of conservative treatment, as a rule, while circular ones are apt to require amputation.

Circular lacerations involving the chief blood-vessels and nerves as well as the muscles require amputations.

In estimating the condition of an injury the extensive lacerations should receive less consideration than great injury to an extensive area of skin.

Compound fractures which sever a large nerve trunk do not require a primary amputation; conservatism should always be tried. The nerve may be sutured and spliced if necessary.

Compound fractures with injury to one system of blood-vessels when there are two do not require primary amputations. When both systems of blood-vessels are torn amputation, as a rule, is necessary. Anastomoses of blood-vessels at the site of a badly mangled limb may not, as a rule, successfully be done.

When fractures are comminuted as well as compound, injuries to the soft tissues are much more extensive. Areas of thromboses will be much greater and conservatism be less successful.

In any given case while it is probable that conservative attempts may save a limb but leave it in a useless condition, or in a doubtful state, it would be best to amputate if the amputation would assure a useful stump, unless the injury be high up in the thigh, where the mortality rate of amputation is high.

The individual and his trade or employment should always be taken into consideration in determining whether the probabilities should weigh for or against an amputation.

Doubtful conservative attempts in cases of very seriously crushed limbs have a larger percentage of mortality than amputations have. This fact should also be taken into consideration.

In all cases of doubt, having carefully considered the foregoing facts, one should always delay the amputation. Conservation is always the proper policy when there is a good chance for its success.

The first sign of gas bacillus or streptococcal infection in these very doubtful delayed cases should determine an amputation immediately and the open treatment of the stump afterward.

He treats crushed extremities by suspending them from an overhead beam. He does not consider an infected wound a contraindication to the use of bone plates in compound fractures. Treatment should not be considered ended until the man in industrial life who has been seriously injured has been sent back in a condition to follow his trade or some trade which will prevent him being a burden on the community.

NEWER CONCEPTIONS OF THE PATHOGENESIS AND TREATMENT OF EMPYEMA.

MOSCHCOWITZ (*American Journal of the Medical Sciences,* May, 1920) thus concludes an excellent article:

Empyema in most instances results from the rupture of a small subpleural pulmonary abscess.

An empyema is the final stage of a process in which the first stage is a serous pleurisy and the second a seropurulent pleurisy. The latter is the so-called "formative" stage of an empyema.

The "formative" stage is unaccompanied by pleural adhesion. The stage of final empyema is always accompanied by adhesions.

The vast majority of empyemata are of the encapsulated variety. Very few occupy the entire pleural space.

Metastatic suppurations accompanying empyema are to be found rather as complications of the causative pneumonia than of the empyema.

The treatment of an empyema should be begun in the formative stage before the exudate has been converted into frank pus.

It is unwise to perform an operation in the formative stage. The morality is terrific because the accompanying pneumonia is still in full bloom, and, furthermore, because of the absence of adhesions there occurs a pneumothorax with "fluttering of the mediastinum" and consequently embarrassment of the heart action.

The best surgical procedure in the formative stage is repeated aspiration, done every twelve to twenty-four hours, in order to relieve the respiratory embarrassment due to the mechanical pressure of the rapidly accumulating fluid. In a few cases this measure is curative.

Feeding with a diet rich in calories is an important adjuvant in the treatment of the formative stage.

The treatment in the acute stage of an empyema consists in a simple intercostal thoracotomy. This operation need not be considered an urgent one, and should be performed when the patient's condition is otherwise perfectly satisfactory. This is the so-called "late" operation.

Urgent thoracotomy is indicated only in acute pyopneumothorax.

The Carrel-Dakin treatment, properly carried out, has proved of superlative value in the postoperative treatment of empyema and should be used in every case. There are no contradictions to its use.

The mortality of acute empyema by these methods is lower than that reported by other methods of treatment.

Empyema cavities heal by three methods: (*a*) By the formation and absorption of a sterile exudate: (*b*) by the formation and "absorption" of a closed pneumothorax; (*c*) by the "classical" method—*i. e.,* the expansion of the lung and obliteration of the pleural cavity by adhesions.

Chronic empyema should not occur, or at least should become very rare, if the methods of treatment of acute empyema as formulated above are practiced.

"Chronic" cases of empyema may be defined as such which are not amenable to treatment by the Carrel-Dakin method.

Recurrences in empyema are usually the result of undue haste. The percentage of recurrences is less after the Carrel-Dakin method of treatment than after any other.

The vast majority of operations that have been devised for chronic empyema will have a very limited field of usefulness if the methods of treatment advocated above are carried out.

RESULTS OF OPERATION FOR CHRONIC APPENDICITIS.

GIBSON (*American Journal of the Medical Sciences,* May, 1920) reports on the results of 555 cases operated on for the relief of symptoms attributed to chronic appendicitis. In 1913, of 70 cases the results were unsatisfactory in 28; most of these were done by the McBurney incision. In 1917, of 119 cases 24 per cent were unsatisfactory in their results; one-third of these were opened by the McBurney incision. In 1918, 20 per cent of those operated on resulted unsatisfactorily; only six

of these were opened by the McBurney incision. Of the 21 cases operated on in 1919, 11 per cent were unsatisfactory in results; only one-tenth of these were operated upon by the McBurney incision.

There were but three deaths in the series. Twenty-six cases were subsequently admitted and operated upon again.

Analysis of the chief complaint following operation shows pain in some form as the main symptom. This may be vague, located in the appendicular region, and similar to the pain which preceded operation, or at times may be placed in the epigastrium.

Gibson states that to avoid disappointing results after operations for chronic appendicitis he would recommend the taking of a comprehensive and detailed history, a complete and thorough physical examination, including the application of all refinements of diagnosis, and the exercise of caution in undertaking operation, particularly in the case of women.

In this class other lesions may coexist or may be mistaken for appendicitis. Particularly he advises the avoidance of neurasthenics of any age or sex, and urges particular restraint when there is no clear and reliable history of well-defined acute attacks, especially of localized pain accompanied by nausea or vomiting.

He advises a good-sized incision, and, even if a frankly pathological appendix is found, search must be made for other possible lesions. If no obviously pathological appendix is found, such a search must be comprehensive and exhaustive, a supplementary incision being made if considered necessary.

It suddenly occurred to Gibson that the explanation of the very marked improvement in results for the six months ending July 1, 1919 (11 per cent of unsatisfactory results as compared with 20 per cent in the year 1918), might very well be due to the absence of the irritating property of iodine, as in December, 1918, he instituted in his service the use of 5-per-cent alcoholic solution of picric acid for the skin. He is sure of the superiority of this method as regards irritation of the skin. Of nearly 1500 cases he has had only one that showed any irritation at all, and that particular case was extremely trivial.

Should the presumption raised by this improvement in his figures be confirmed by further experiments, especially by others, a very notable improvement in operative technique would ensue. As noted, the chief and very constant complaint of patients returning for observation who were not satisfied by their operation is pain, and it might well be due to the irritation of the iodine, as it is particularly noticeable that the pain so frequently mentioned is at the operative site, although an unquestionably pathological appendix has been removed.

PROJECTILES IN THE CHEST.

MOYNIHAN (*British Journal of Surgery*, April, 1920) notes that the frequency with which symptoms are present in the case of those harboring projectiles in the chest is uncertain. The great majority of men do make some complaint of subjective phenomena. Moynihan observes that the mediastinum with all its contents may be pierced by a bullet or a fragment of shell and the parts suffer not the slightest injury. Adhesions of the two pleural surfaces are nearly always present, sometimes slight, sometimes extremely dense. The lung may adhere along the inner side to the mediastinum, or to the pericardium. On the left side, especially, it may be difficult to say whether a foreign body which moves with the heart is in the edge of the lung, or on or in the pericardium; for the parts adhere strongly and are not anatomically distinguishable one from another—a mass of fibrous tissue binds them all together. In eleven out of eighteen projectiles examined bacteriologically there was infection by staphylococcus aureus, streptococci, pneumococci, or coliform bacilli. In seven the foreign body was sterile.

Pain, fairly constant, increased on exertion, is a common symptom. This pain is no worse in those cases in which very extensive and extremely dense adhesions are present. Turner notes that pain and tenderness are particularly marked in cases characterized by a localized area of ad-

hesions in the track of the missile, a part only of the lung being firmly anchored to the pleura, the rest being free to move. Dyspnea varies greatly, probably due to embarrassment of the lung crippled by adhesions, or to a massive remnant of an old hemothorax, or to the shrinkage of the side of the chest, or the mediastinal collapse of the lung which follows an empyema. Cough is frequently noted and in some degree is constant. In a few cases hemoptysis occurs. These patients frequently refer to attacks of cold or chills. These attacks last only a few days. The patient feels miserable, has "gooseflesh," and keeps huddled over a fire. The dyspnea and cough are a little worse, slight hemoptysis may occur, and exertion is avoided. The temperature is raised for one or two evenings to 100° or 102°, and the attack passes off.

As to the method of operating Moynihan notes that danger incident to operative pneumothorax has been overestimated.

The entrance of air into the cavity of the pleura has produced one effect only, a temporary quiescence or cessation of the respirations. He obtains deep anesthesia before opening the pleura and allows the air to enter slowly through an incision, which, small at first, is subsequently freely enlarged to allow the easy entry of the hand into the chest cavity. The lung at once collapses, but not to the degree expected. This collapse is entirely to the advantage of the surgeon; it allows his manipulation to be more freely conducted within the chest; it enables him to reach all parts of the lung more easily; and to withdraw the whole of it except the hilum from its ordinary position up to the anterior wound and even outside the chest wall. Moynihan believes that the removal of the projectile is only a part and not always the most important part of the operation. The adhesions he believes would account for most of the disabilities. To the explanation of this he devotes much attention. Five of his cases of empyema followed a separation of the dense adhesions. In all of these the foreign body was infected, and in all there was hemorrhage into the pleural cavity after operation. Where oozing cannot be stopped at the time of operation drainage gives safety and comfort. Continuance of the tube longer than thirty-six hours is probably harmful.

Ether is the anesthetic of choice, given through a glass inhaler. This is carried to deep anesthesia at the time of the incision of the pleura. Oxygen is given with the ether. There is, of course, careful radiological study of all cases. Whatever operation is practiced upon the chest, the most accurate localization of the foreign body by *x*-rays is desirable; and the condition of the lung, the presence of pleural adhesions, and the range of movement in the diaphragm, should all be investigated.

So far as our present knowledge goes, the indications for operation seem to be the continued presence of subjective symptoms; the condition of the foreign body and the lung surrounding it; the condition of the pleural cavity.

Moynihan notes that the removal of foreign bodies from the chest, speaking broadly, is accomplished by either of two types of operation—the method of Petit de la Villeon, and the open method. The open operation, slightly modified, is the method employed by Moynihan.

The operation after the method of Dr. Petit de la Villeon consists in the introduction, through a very small incision made between two ribs, of a special pair of forceps, with a blunt end and long parallel blade on the one side of the hinge, and short "crocodile-jaw" blade on the other. The position of the foreign body is accurately determined by the *x*-ray. The operation is performed under the *x*-ray and with the aid of the screen. A preliminary injection of morphine is given and a light general anesthesia induced. Petit de la Villeon uses chloroform. The forceps are introduced from the axillary side, the incision to admit them being made along the upper border of the rib, to avoid vessels, and are guided by the image on the screen toward the known position of the foreign body. The progress of the instrument is slow and

gentle, and continues until the image of the tip of the forceps and of the foreign body coincide. If the entry has been expertly made the contact will then be felt; the metal is grasped by the wide opening of the "crocodile-jaw" blades, and is slowly and steadily withdrawn. Nothing remains but to close the skin wound by a single stitch. The penetration of a blunt forceps into the lung tissue does no damage. It ruptures no vessels; it does no injury to the delicate tissues of the lung; it seems to cause a separation of the tissues rather than a destruction of them.

The postoperative course is so smooth and devoid of incident as to excite the frank astonishment of all who see the method practiced for the first time. The functional recovery is said to be at least as good as that which follows the open operations, and is obtained at less risk and less cost in respect of suffering and duration of convalescence.

One of the few fatalities in the large series of cases operated upon by Petit de la Villeon occurred as the result of hemorrhage after extraction of a piece of metal from the hilum. He and every other surgeon now agree that for all retained projectiles in this position an operation is necessary. It is imperative that the work to be done should be carried out under open inspection, that steps should be taken to avoid laceration of the large and numerous vessels in the root of the lung, and that such hemorrhage as occurs should be arrested either by suture or, as Petit de la Villeon prefers, by packing with gauze for two or three days.

In one of his cases reported in *Bull. et Mem. Soc. de Chir. de Paris,* 1918, Petit de la Villeon describes the projectile as "appearing to be included in the wall of the left ventricle of the heart." It was extracted by his method, the forceps passing through the entire thickness of the lower lobe of the left lung. In another case some fibers of heart muscle were found on the missile after removal. In his most skilful hands the method does not appear to have presented unusual difficulties or serious dangers; but it is nevertheless one to be condemned. In all cases in which the projectile is adherent to the surface of the heart, or in which the lung is so adherent to the pericardium, and this membrane to the heart, that it is impossible to say how close the connection between the missile and the heart may be, the open operation alone should be practiced.

The great majority of the foreign bodies lodged in the parenchyma of the lung are of so small a size as to allow of their easy extraction between the ribs. It the projectile is large, a piece of rib may be resected or raised, and the remainder of the operation conducted in the usual manner. But even then the damage done to the lung by the forcible dragging through its tissues of a large solid body must be taken seriously into account. For large projectiles the open operation is either the only possible method or the safer.

When it is evident that a small abscess surrounds the foreign body, or that it is encased in a hard sclerotic mass, it is unwise to attempt the removal by this method. It is impossible to say whether the pus which lies on all sides of the missile is heavily infected or no; but it is well to take no risks. The removal of the foreign body in all such cases should be done under full inspection, so that an adequate cleansing of the infected cavity may be secured.

The essential circumstance for the successful extraction of the projectile by this method is its mobility with the lungs. This is indicated by the *x*-ray; the shadow of the foreign body should move downward concomitantly with the diaphragm. The exception is in the case of foreign bodies in the apex of the lung, where the range of movement is slight or absent. This freedom of motion indicates that the metal is not embedded in a mass of dense adhesions outside the lung, extrication from which would involve gross and heavy-handed measures. The benignity of the operation is remarkable. It is rare for a patient to be incapable of discharge from hospital in eight or ten days.

In the open operation of Duval an incision is made exactly in the line of a rib

following its curve, from the edge of the sternum outward, for about 5 inches. As a rule the fourth rib is chosen. If the projectile is in the apex of the lung the third rib may guide the line of incision; if the projectile is at the lower part of the chest the fifth rib is selected. The room given for the introduction of the hand is greater, the lower the incision is made. The incision cuts through the skin, subcutaneous tissue, and pectoralis fascia, and exposes the fibers of the pectoralis major muscle. A pair of forceps is pushed through the fibers of the muscles until it touches the rib; the blades are opened and the muscle is split, and the separation is widely made from end to end of the original incision. The pectoralis minor is then exposed, and may be split in the same manner, or cut away until the outer surface of the rib is seen. All vessels which bleed, and there are many, are carefully ligatured: for a very dry wound is essential.

The rib and costal cartilage are now well exposed. Through the periosteum two incisions are made close to the upper and lower edges of the rib, and from them the periosteum is stripped upward and downward and from the posterior surface. The periosteum which lies between the two incisions is not separated from the rib, but remains attached to it through all the stages of the operation.

As soon as the periosteum is freed from the posterior surface for half an inch, the periosteal elevator of Doyen is slipped around the rib, and pushed backward toward the axilla and forward to and along the costal cartilage, until a length of about 5 inches is cleared. Here and there a little help may be needed with the knife or scissors to make the way easy for the instrument. The costal cartilage is now divided by two incisions meeting at a point; this allows the divided ends to dovetail together when the operation is nearing completion. When the cartilage is divided, a gauze strip is passed underneath the rib, which is lifted gently upward and outward.

In young patients the elasticity and suppleness of the rib are remarkable. It is quite easy to raise the bone out of the way throughout the operation and then to replace it. The third rib does not lift so easily as the lower ribs, being shorter and therefore more resistant. In four cases (three of the third rib) the bone has fractured as the result of the drag made on it. In three cases it was replaced and united firmly. When the rib is elevated the periosteum is seen as a thickening of the pleura exposed in the wound.

Through periosteum and pleura a small incision is made, with the result that, in the absence of adhesions, air slowly enters the pleural cavity, and the lung begins to collapse.

An inspection of the chest is now made, and note is taken of any adhesions that may be found. The adhesions vary to a great extent; they may be few and of the lightest texture, breaking down with the gentlest handling; they may be most universal, requiring a firm effort to separate them; they may be of the utmost density, ¼-inch in thickness, so firm and strong that a separation with the finger alone is quite impossible. The restriction of the free expansion of the lung by adhesions was to be considered as perhaps the most essential point of the operation. The separation of adhesions, except those of the toughest sort, is best carried out by the procedure of "gauze stripping" which is adopted in the separation of a hernial sac. On separating adhesions, cavities containing old blood-clot may be found. The adhesions bleed freely, but the hemorrhage is very easily and rapidly checked by the pressure of hot moist swabs, one or two being left in the cavity while the operation proceeds.

When the lung is freed the projectile may be sought. It is easier to find a metallic foreign body in the lung than in any other part of the body. When the organ is gently grasped in the fingers a local hardness is felt at once. The part of the lung which holds the metal is then brought to the surface. It is astonishing to find with what ease the posterior part of the lung, for example, can be brought forward to the wound, and held there while the foreign body is extracted. The mobility of the

lung, and the ease of handling it, are remarkable. The lung may be grasped with the hand, or held lightly in the specially devised lung forceps of Duval, the grasp of which is firm and delicate. When the lung containing the projectile has been lifted forward, the depth of the missile from the surface is gauged, and steps are taken to remove the metal. A pair of blunt forceps may be pushed through the lung substance until they impinge on the bullet, the blades are opened, and the body is grasped and gently disentangled from the lung. Or an incision may be made through the lung directly down to the body, which is laid bare and removed. The wound in the lung is now touched with pure carbolic acid, and closed by catgut sutures which closely approximate the pleural edges.

Throughout all the manipulations the lung is handled with extreme gentleness. The light hand and the tender caress are as necessary in this branch of surgery as in all abdominal operations, and equally repay the surgeon in the quick and quiet recovery of his patients. The heavier the handling of the lung, the greater appears to be the subsequent respiratory distress from which the patient suffers.

The wound in it being closed, the lung is allowed to drop back into the chest, and pains are taken to see that all the fluid is removed. Bleeding must be checked by pressure, for the exudation of even four or five ounces on the day following operation is enough to cause distress. The retractor is now removed, and steps are taken to close the pleural wound. The apposition is often very difficult, especially at the inner end of the wound, and the stitch may cut through if any special tension is put upon it. Help may be obtained by passing one strong suture round the ribs above and below, and dragging them closely together.

The rib is now replaced: a stout catgut suture passed through the costal cartilage holds the ends in apposition, and this is helped very much by the dovetail incision which was made to divide the cartilage. Over the rib the pectoralis minor muscle is sutured, and the fibers of the pectoralis major are brought together by three or four stitches. The pectoralis fascia is carefully sutured in all its length, and finally the skin is closed by a continuous suture.

As a rule the after-course is simple. The following complications may be seen: Hemoptysis has occurred seven times in 49 cases. As a rule it is of the slightest and causes no concern: once only has there been a degree of hemorrhage which could be assessed at 3 or 4 ounces, occurring in the first twenty-four hours.

Respiratory distress occurs rarely. It has only been noticed in cases in which a multitude of severe adhesions had to be separated, and the lung rather heavily handled. In 12 cases an effusion of blood or serum has been discovered on the third or fourth day, and aspiration has given a relief that was striking in proportion to the amount of fluid removed.

Surgical emphysema has developed in several cases, especially those in which a poor apposition of pleural surfaces was obtained. It has twice spread over the neck and face. It has always rapidly disappeared, and has never been a matter for distress.

In 10 cases empyema had been present before operation. There were 12 cases in which effusion of blood occurred into the pleural cavity after operation; of these, 5 developed empyema. In every such case the foreign body was infected. In the remaining 7 cases aspiration was performed, and the chest condition rapidly cleared up; in 6 of these cases the foreign body was sterile, and in one infected.

The root of the lung is that part of the pedicle of the lung at the region where the pleura is reflected on to it. The measurements of the root are from above downward about 30 mm., and from before backward about 15 to 18 mm. The surface marking in front is the third costal cartilage and the adjacent intercostal spaces on each side; and, behind, the inner end of the fifth rib and the adjacent intercostal spaces on each side. In the root of the lung lie the bronchi, pulmonary artery and veins, bronchial artery and veins, lymphatic glands and vessels, and nerves. The glands

are numerous. The pedicle enters the lung at a vertical notch, the hilum, about 45 or 50 mm. long and 25 mm. broad.

The special considerations in connection with operations upon the root of the lung are, chiefly, the extreme vascularity of the part, its fixity, and its physical properties.

The number of vessels is great and their size formidable. A wound of the root of the lung should be inflicted with extreme caution, for if a vessel is wounded it is difficult to arrest the hemorrhage. It is almost impossible to secure the vessel and to ligature it in the ordinary manner. If a suture is passed round the vessel, it is likely that other vessels will be wounded by it. For this reason many of the French surgeons advise the plugging of the wound with gauze, which is left in position for two or three days.

One of the fatal cases died from hemorrhage. The projectile was embedded in the root of the lung. After its gentle removal there was free hemorrhage, which appeared to be arrested by the sutures passed for this purpose. The patient died in a few hours, and the pleura was found filled with blood. The error in technique was grievous, and the warning for similar cases did not go unheeded.

The fixity of the root makes all operations upon it far more difficult than those which engage other parts of the lung. The root of the lung is almost immobile. The operator must go down to it: he cannot bring the parts nearer to him. All the steps of the operation can, and should, be visible to the surgeon: nothing need be done in the dark; but the remoteness and the immobility render all manipulations much more difficult than they are elsewhere. All technical procedures at the root of the lung are made easier if the parts near the hilum are fixed by the special light forceps of Duval.

The physical properties of the root of the lung make it exceedingly difficult to distinguish a bronchus from a piece of metal.

The following is an epitome of the writer's experience: 49 cases have been treated by operation; 2 cases have died, one from hemorrhage following the removal of a projectile from the root of the lung, and one from sepsis after the removal of an infected foreign body and a piece of clothing.

The late history has been obtained in 43 cases. The results may be described as good, fair, bad.

The patients with good results are, they say, in perfect health, and are able to do heavy work. Of these there are 24, equal to 55.8 per cent.

Some of these patients are better than before operation, but still have some shortness of breath, or unusual respiratory trouble when having a cold, or in bad weather. Some are a little better since the operation. Of these there are 14, or 32.5 per cent.

Two patients died; three are unable to do any work, or have serious respiratory trouble, shortness of breath, cough, etc.

SHORT UMBILICAL CORD.

BACON (*Surgery, Gynecology and Obstetrics,* June, 1920) recalls the fact that thirty-two years ago, in January, 1887, John Bartlett presented to the Chicago Gynecological Society a paper on dystocia caused by malposition of the cord, reporting a case in which this was coiled four times around the neck of the child.

He thereupon reports in detail a case occurring in his own practice. Our chief interest is naturally in the problem of diagnosis as determined by the symptoms and findings. Bacon's own experience in diagnosing absolute or relatively short cord has not been encouraging. He has had two cases of absolute short cord; one terminated with forceps, when cutting of the cord seemed desirable to permit the birth of the body. He moreover had a few cases in which the cord, coiled around the neck of the child, had to be cut to allow the birth of the body. In none was the diagnosis made before the birth of the head.

The usual symptoms were absent or not prominent. There was no special tenderness in any region of the uterus and no retraction of any part of the uterine wall during contractions. There was no hemorrhage due to partial separation of the

placenta. As the head had not escaped from the uterus there was no recession of the head from the vulvar outlet. No funic souffle was heard, although perhaps 100 examinations were made during the labor to control the condition of the fetus. It must be admitted, however, that no attempt was made to listen during contractions, and hence the intermittent souffle mentioned by Halzbach as found during contractions and due to tension on the cord may have existed. As the head was still in the uterus the condition was probably not present for the intermittent urination described by Brickner. At any rate this symptom was not observed. There were in short no symptoms of short cord except very slow dilatation of cervix and prolonged labor.

The suggestion of Haake did not occur to the author: to examine through the rectum for the coils around the neck of the child. This would not have been possible, of course, during the first three days of the labor before descent.

In regard to treatment Bacon calls attention to King's special consideration of this subject and his enthusiastic advocacy of postural treatment. Of the various reasons given to explain the advantage of a sitting or squatting posture, the most probable seems to be that it favors descent of the uterus and so brings the point of the insertion of the cord nearer the outlet of the pelvis. This posture might likewise have favored dilatation in his case. The obstetrical chair lately reintroduced into our armamentarium by Markoe might serve our need here. The simplest method would be to let the patient sit up or kneel or squat in bed.

If after the birth of the head the expulsion of the body is rendered impossible on account of relative shortening of the cord by coiling around the neck, it is only necessary to clamp and cut the cord. Any attempt to release a coil and pull it over the head may prove harmful or dangerous by separating the placenta. This is one of the important reasons for the adoption of Schultze's rule to make no attempt to release funicular coils during labor.

TUBERCULOSIS OF THE JOINTS.

SCHWYZER (*Surgery, Gynecology and Obstetrics,* June, 1920) states that there are two main channels by which the human body becomes infected with tuberculosis—the lungs and the alimentary canal.

In children, Fraser has found 60 per cent of all joint tuberculosis to be the bovine type, an infection directly traced to tuberculous cow's milk. The alimentary route in children, therefore, is predominant.

In adults the bovine infection becomes negligible. The tuberculous infection of the joints is here of more secondary nature; in the lungs we have to look for the probably primary focus.

Of less importance are the channels for tuberculous infection from the tonsils, from the pharyngeal mucous lining, and infected gum tissue. They are the direct source of lymph-gland infection in the neck.

Joint tuberculosis is prevalent in the first two decades of life.

The question whether trauma is an etiological factor for the start of the disease has given rise to much dispute. Not only do we find almost constantly a minor trauma mentioned by the patient in the history of the sickness, but also experiments point to the fact that traumata, and often surprisingly light ones, have a distinct significance in the start of the disease.

The hip and knee joints are most frequently affected by tuberculosis; the elbow, ankle, wrist, and shoulder follow in frequency as enumerated.

There are two principal types of infections to be considered: one an invasion from a near-by bone focus; the other through the capsule from a tuberculous focus in the neighborhood, especially tuberculous synovitis.

The most frequent is the infection of the joint from the side of the bone. Years ago Volkmann said that in children tuberculous arthritis always starts from an osteitis, especially osteomyelitis, and even Koenig in his monograph on coxitis avoids speaking of a primary and secondary synovitis.

The primary tuberculous synovitis, also called synovitis fungosa granulosa (the white swelling—tumor albus), is of a more chronic character. It has a greater tendency to heal, especially in children.

Numerous, distinct tubercles form in the synovialis, which is ultimately replaced by tuberculous granulations. In lighter forms of infection, the joint contains a serous hydrops (Koenig). The fluid is yellowish and clear. Here conditions can remain unchanged for a long period of time. White flakes in that hydrops are fibrinous deposits.

The peculiar white swelling, so characteristic in the knee and elbow joints that the diagnosis often can be made prima vista, is due to hyperplasia and infiltration, not only involving the capsule, the ligaments, and the tendon sheaths, but also the subcutaneous tissue.

European surgeons of late years have given Rollier's heliotherapeutic treatment for surgical tuberculosis due consideration. Men like Bardenheuer, after personal inspection of the hospitals at Leysin, have become enthusiastic about the treatment. DeQuervain, in Berne, as a leader, advocates the view that heliotherapy applied in the sense of Rollier is taking the place of bloody operations for closed surgical tuberculosis.

Sun rays are combined with open-air treatment at an altitude of from 3500 to 5000 feet. The body of the patient is cautiously, that is very gradually, allowed to be influenced by these solar rays as well as by the open air. It is astonishing how the body, which at first is exposed to the rays for only a few minutes a day, can stand later on the solar rays for hours. Complications of the skin, headaches, and tachycardia are cautiously avoided. The skin soon becomes tanned. It changes from a light brown into a deep copper color. It is characteristic that the dark-complected individual tans deeper and that his prognosis is better. The immobilization of the joints is done only when needed and then only by removable splints and extensions not interfering with the treatment.

The sun rays show their beneficial influence within days and the analgesic action is striking. Rollier's statistics show that uncomplicated, closed tuberculosis of the joints is definitely and permanently cured within two to three years with *restitutio ad integrum*.

De Quervain says that the treatment with the alpine solar rays for surgical tuberculosis in the human has ceased to be an experiment.

The sun rays are divided into two classes: long waved and short waved ones. In the latter group belong the ultraviolet rays. This portion of the spectrum of the sunlight is the therapeutically active one. These rays are the cause of the pigmentation of the skin. They differ in action and influence in different altitudes. In the lower altitudes, contrary to the higher altitudes, these shorter waves (the ultraviolet ones) are principally absorbed by the denser atmosphere that contains more dust and moisture.

RESIDENTIAL ANTENATAL AND POSTNATAL TREATMENT.

RUNDLE (*Lancet*, June 12, 1920) reports from the London Lock Hospital for Women that there have been 168 pregnant women delivered during the last two months. Of these, 92 were cases of syphilis and 76 were cases of gonorrhea. Of the 92 cases of syphilis five babies were stillborn and nine died in the early weeks after birth, the remaining 78 doing excellently.

The syphilitic cases admitted can be divided into six classes; cases admitted late in pregnancy with marked clinical signs of generalized syphilis; cases admitted early in pregnancy with the clinical manifestations of generalized syphilis; patients admitted early in pregnancy with a primary sore as the only sign and a negative Wassermann; cases admitted late in pregnancy with a primary sore and a negative Wassermann; cases which had had a full course of treatment before they become pregnant; cases admitted with no clinical signs, only a history of miscarriages, and giving a positive Wassermann.

The bad results, he found, all belonged to Class 1. The babies in all the other

classes did splendidly. It is impossible to say how many of the children born alive were (1) healthy, (2) syphilitic, as the Wassermann reaction of the umbilical blood proved paradoxical and that of the infants' blood was almost invariably negative a few days after birth.

A few of the infants were premature and had to be reared in incubators. In the treatment of the mothers two facts stood out: the excellent manner in which they withstood large doses of arsenic and mercury right up to full term, when these were indicated; the extraordinary tonic effect of treatment. Although most of the women on admission had stomatitis, which was not infrequently aggravated by the arsenic and mercury used subsequently, it proved no bar to energetic treatment owing to the readiness with which it could be kept in check by intramine. It was found that one or two injections of intramine would permit of the assimilation of much more mercury; in some cases as much as 10 gr. of pil. hydrarg. were taken daily with impunity, though previous signs of intolerance to the drug had been manifest.

A word about intravenous injections may be of interest. The external jugular vein was the site chosen; this vein, as Mr. Gibbs has often shown at his demonstrations at the London Lock Hospital, is generally to be preferred to the scalp veins or the superior longitudinal sinus through the anterior fontanel. The child is placed in the horizontal position, its head rotated to one side and firmly held by an assistant; when the child cries the vein distends, and the needle point is then inserted. This site is convenient also for taking blood for Wassermann tests.

As to the dosage of "914," Mr. McDonagh's standard for infants of a milligramme per pound weight was the initial dose used; this dose was increased as the child advanced in weight. Four premature infants were successfully reared in electrical incubators, one baby weighing 3½ pounds when born. The infants were fed on the four-hourly system—that is, five feeds in the twenty-four hours—and an eight hours' rest at night for both mother and child; the mothers thus got their natural sleep. and so secreted more milk.

At first there was some difficulty in getting the mothers to feed their babies, which, being in many cases illegitimate, were looked upon as encumbrances, but, owing to the foresight of Mr. Gibbs, prizes were offered periodically to the mother whose baby put on most weight. This competition quickly produced the desired results. When a mother left the hospital she was requested to report immediately she became pregnant again, as it has been found that the birth of a healthy child can only be guaranteed if the mother is treated throughout each succeeding pregnancy.

Rundle states that experience has shown that, if syphilitic pregnant women come up for treatment early enough, 100 per cent of the children would be born alive.

Considering how profuse was the discharge in most of the gonorrhea cases treated and delivered in the hospital it is surprising that no complication, beyond an abscess in Bartholin's gland, was met with; pregnancy might have acted as a safeguard, but much more of the success was undoubtedly due to the regular douching and swabbing out with Milton, recommended by Mr. Lane. This preparation is a strongly hypertonic saline solution, containing free hypochlorous acid in unusually high proportions; it is non-toxic to the tissues, and is a rapid solvent of pus and mucus. He uses it, a tablespoonful to a pint, as a vaginal douche, and half a teaspoonful to a pint for bladder and urethral irrigations in cases of urethritis; he uses it also (strength 1 in 10) for irrigating Bartholin abscesses and buboes after incision with most gratifying results.

It is most satisfactory to report that not a single case of ophthalmia neonatorum has occurred in the cases born in hospital, a result which redounds to the credit of the nursing staff. The moment an infant is born its eyes are washed with a one-per-cent solution of silver nitrate, and, if the eyes appear to be a little inflamed a day or two later, collosol argentum (1 in 2000) is used as an eye douche, as it is less irritating than silver nitrate.